

Wolf Management Report

of survey-inventory activities
1 July 1999–30 June 2002

Carole Healy, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation
December 2003



ADF&G

Please note that population and harvest data in this report are estimates and may be refined at a later date.

If this report is used in its entirety, please reference as: Alaska Department of Fish and Game. 2003. Wolf management report of survey-inventory activities 1 July 1999–30 June 2002. C. Healy, editor. Juneau, Alaska.

If used in part, the reference would include the author's name, unit number, and page numbers. Authors' names and the reference for using part of this report can be found at the end of each unit narrative.

Funded through Federal Aid in Wildlife Restoration, grants W-27-3, W-27-4 and W-27-5.

Alaska Game Management Units



WOLF MANAGEMENT REPORT

From: 1 July 1999

To: 30 June 2002

LOCATION

GAME MANAGEMENT UNIT: 1A (5,300 mi²)

GEOGRAPHIC DESCRIPTION: Unit 1A Unit 1 south of Lemesurier Point, including all drainages into Behm Canal and excluding all drainages into Ernest Sound.

BACKGROUND

Wolves live throughout the islands and mainland of Unit 1A, although densities on the mainland are generally lower than on maritime-influenced islands. Wolves are capable swimmers and regularly travel between adjacent islands in search of prey.

Wolves feed primary on deer in southern Southeast Alaska, particularly on islands in the area. On the mainland, where deer densities are generally lower than on islands, wolves primarily prey on mountain goats and moose. Marine mammals, salmon, waterfowl, and small mammals supplement the diets of local wolves.

The coloration of Southeast wolf pelts varies; however, the brown/gray color is most common. During the past decade, white or near-white pelts have comprised less than 1% of the harvest while black pelts have accounted for about 20% of the Unit 1A harvest.

From 1915 through the early 1970s, cash bounty was paid for wolves taken in the region and in the 1950s Federal agents poisoned wolves on many Southeast islands in an effort to increase or maintain deer numbers. None of these programs had long-lasting effects on wolf abundance or distribution. However, in 1990 Southeast Alaska wolves, named by some taxonomists as the Alexander Archipelago wolf, were identified by a USDA Forest Service-sponsored interagency committee as a species for which there were concerns about viability or distribution as a result of extensive timber harvesting in the Tongass National Forest. In 1993 the Biodiversity Legal Foundation (Boulder, CO) and an independent biologist from Haines, Alaska filed a petition with the U. S. Fish and Wildlife Service (FWS) requesting that Southeast Alaska wolves be listed as a threatened subspecies pursuant to the Endangered Species Act. The FWS ruled that listing was not warranted at the time, but indicated that they felt it was clear that without significant changes to the existing Tongass Land Management Plan, the long-term viability of Southeast wolves was seriously imperiled. A comprehensive conservation assessment was subsequently prepared through the USDA Forest Service (Person et al. 1996). The most important consideration identified in the assessment was the

need to maintain a long-term carrying capacity for deer, the principal prey for most wolves. The authors suggested that a series of old growth forest reserves might increase the likelihood that wolves would persist where extensive timber harvesting had occurred or was planned. Several old growth reserves have been identified for Units 1A and 2.

MANAGEMENT OBJECTIVES

Our management objectives are to maintain an average annual harvest of at least 20 wolves from Unit 1A. This level reflects the average harvest for this unit during 1984–1990.

METHODS

We obtained harvest information through a mandatory-sealing program. By regulation, the left foreleg was left attached to the hide of harvested wolves until sealed for aging purposes. Information obtained from hunters and trappers included the number and sex of wolves harvested, date and location of harvest, method of take, transportation used, and pelt color. We obtained anecdotal information about wolves from hunters, trappers, and department staff. Additional information was obtained from trappers through an annual mail-out survey.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

No current population data are available for Unit 1A wolves. Based on the moderate harvest levels reported and moderate indices of abundance (I_A) reported by trappers, wolves in Unit 1A appear to be stable during this report period (Kephart 2001).

Distribution and Movements

There are currently no research projects in Unit 1A and consequently no radio transmitter-equipped wolves in the unit. Attempts to collar wolves on the Cleveland Peninsula during fall 1999 resulted in 2 males being outfitted with transmitters, however both of those animals died within one month of capture. Anticipated work on Cleveland Peninsula and Gravina Island will eventually provide demographic information in an area with less access (fewer roads) and less historical logging activity to compare to data gathered in ongoing Unit 2 research.

MORTALITY

Season and Bag Limit

Residents and Nonresidents

Hunting:	August 1–April 30	5 wolves
Trapping:	November 10–April 30	no limit

Hunter/Trapper Harvest. The Unit 1A wolf harvest during this report period was slightly higher than the previous 3-year period and higher than the long-term average. Total harvest during 1999 was 47 and during both 2000 and 2001 there were 44 wolves harvested. The sex of the harvest during this report period was split, with slightly more females (52%) than males (48%). Trapping continues to be the most successful method of taking wolves (49%) followed by snaring (25%) and ground shooting (23%).

The 1999 harvest of 46 wolves was the second highest since 1985 and well above the long-term average of 30. The average catch per trapper was also the highest on record. Fifteen trappers took an average of 3.1 wolves during 1999. That winter was severe in terms of snow depth and snow persistence. Snow accumulations up to 3 feet forced deer to lower elevations and wolves consequently spent more time at low elevations and along beaches, making them more accessible to trappers using boats.

Hunter Residency and Success. Local residents regularly account for 94–100% of hunters and trappers taking wolves in Unit 1A. Ninety-five percent of the harvest since 1990 has been taken by local residents, followed by nonlocals (3%) and nonresidents (2%). During 1999–2001, residents have harvested 98%, 98%, and 95% of the total, respectively. Nonresidents that harvested wolves took them incidentally during September by ground shooting. Hunters often encounter wolves while pursuing other big game species.

Harvest Chronology. March has historically seen the peak of the Unit 1A wolf harvest, followed by February. In the past 2 years the harvest was spread over the open season, with slightly more taken during December and March. During both the 1999 and 2000 seasons, March saw the highest harvest of wolves. The 2001 season was different with the majority of trappers more successful during January (25%) and February (16%).

Transport Methods. Boats and off road vehicles continue to account for the majority of transport methods used by successful Unit 1A wolf hunters and trappers. During this 3-year report period the majority of trappers used boats (86%), while the remainder used off road vehicles (12%) and highway vehicles (2%).

Other Mortality

Mortality from natural causes (starvation, accidents, disease, fighting) in exploited populations is low, typically averaging 5 to 10% per year (Fuller 1989). There were no wolves reported as killed by vehicle collisions during this report period. Four wolves have reportedly been killed near Ketchikan on the Tongass Highway by cars since 1985.

CONCLUSIONS AND RECOMMENDATIONS

The management objective of harvesting 20 wolves per season was met during this report period, and we believe Unit 1A wolf numbers have remained stable. Trapping success increased slightly, and trapping effort is up from the preceding 10-year average. The high harvest during the 1999 season likely resulted from severe winter conditions rather than increased wolf density.

LITERATURE CITED

- FULLER, T. 1989. Population dynamics of wolves in north central Minnesota. Wildl. Monog. 105.
- KEPHART, J. 2001. Trapper Questionnaire. Alaska Dep Fish and Game. Statewide Annual Report. Juneau, Alaska USA.

PERSON, D. K., M. KIRCHHOFF, V. VAN BALLEMBERGHE, G. C. IVERSON, AND E. GROSSMAN.
1996. The Alexander Archipelago wolf: a conservation assessment. USDA For. Ser.
Gen. Tech. Rep. PNW-GTR-384. Portland.

PREPARED BY:

Boyd Porter
Wildlife Biologist III

SUBMITTED BY:

Bruce Dinneford
Wildlife Biologist IV

Please cite any information taken from this section, and reference as:

Porter, B. 2003. Unit 1A wolf management report. Pages 1–9 *in* C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 1A wolf harvest, 1985–2001

Regulatory					Method of take			Pelt color			
year	Males	Females	Unk	Total	Shot	Trapped	Unk	White	Grey	Black	Unk
1985	6	5	0	11	1	10	0	0	7	4	0
1986	11	10	0	21	3	18	0	0	16	5	0
1987	14	9	0	23	9	14	0	0	16	7	0
1988	13	8	0	21	10	11	0	0	14	7	0
1989	12	19	2	33 ^a	14	19	0	0	25	8	0
1990	9	6	0	15	9	6	0	0	11	4	0
1991	15	16	0	31	12	19	0	0	29	2	0
1992	26	16	0	42	11	31	0	0	36	6	0
1993	18	14	0	32	6	26	0	0	24	7	1
1994	22	18	0	40	11	29	0	1	35	4	0
1995	24	25	0	49 ^b	17	29	3	0	38	11	0
1996	5	10	0	15	3	12	0	0	12	3	0
1997	13	13	0	26 ^c	8	18	0	0	21	5	0
1998	12	11	0	23	12	11	0	0	17	4	0
1999	23	23	0	46	12	33	1	0	33	10	3
2000	22	21	1	44	8	35	0	0	38	5	1
2001	19	25	0	44	11	31	0	0	33	6	5
Average	16	15	0	30	9	21	0	0	24	6	1

^a Does not include 1 gray female killed by a car on South Tongass Highway, Ketchikan.

^b Does not include 2 gray males killed by cars on North Tongass Highway and White River Road, Ketchikan.

^c Does not include 1 gray male killed by a car on South Tongass Highway, Ketchikan.

Table 2 Unit 1A wolf hunter/trapper transport method, 1985–2001

Regulatory year	Air	Boat	Highway ^a vehicle	Walked	Unknown
1985	0	5	3	0	3
1986	10	11	0	0	0
1987	0	21	2	0	0
1988	0	16	5	0	0
1989	2	26	5	0	0
1990	1	10	2	0	2
1991	1	24	1	5	0
1992	2	30	3	3	4
1993	1	28	2	0	1
1994	1	32	6	1	0
1995	1	33	12	2	1
1996	0	15	0	0	0
1997	0	24	2	0	0
1998	0	20	2	0	0
1999	0	39	1	0	0
2000	0	40	7	0	0
2001	0	35	8	0	0
Average	1	24	4	1	1

^a Includes 3 or 4 wheelers and off road vehicles

Table 3 Unit 1A wolf harvest chronology, 1985–2001

Regulatory year	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
1985	0	0	0	0	0	1	4	3	2	1	0	0
1986	0	1	0	0	1	2	3	11	2	1	0	0
1987	0	0	1	1	0	4	6	3	1	1	3	3
1988	0	1	2	1	3	2	4	0	3	4	1	0
1989	0	1	1	4	4	5	3	3	6	5	1	0
1990	0	0	2	1	4	0	2	2	0	2	2	0
1991 ^a	0	0	0	4	3	2	2	4	9	6	1	0
1992	0	1	1	2	5	6	1	4	15	7	0	0
1993	0	2	0	0	0	3	6	5	13	2	1	0
1994	0	0	2	6	1	1	2	16	6	6	0	0
1995	0	2	3	2	6	5	4	8	12	6	1	0
1996	0	0	0	3	0	1	4	1	3	3	0	0
1997	0	1	0	4	0	6	3	4	6	2	0	0
1998	0	2	2	0	0	0	2	0	5	0	0	0
1999	0	1	0	0	0	0	1	8	12	7	0	0
2000	0	0	2	2	2	7	11	6	8	4	1	0
2001	0	2	2	3	5	6	11	7	3	0	0	0
Average	0	1	1	2	2	3	4	5	6	3	1	0

^a Hunting season and bag limit changed from year round, no limit, to August 1–April 30, 5 wolf limit.

Table 4 Number of license holders who killed Unit 1A wolves, and average catch per trapper, 1985–2001

Regulatory year	Number of license holders harvesting wolves	Average catch/license holder
1985	7	1.6
1986	10	2.1
1987	12	1.9
1988	15	1.4
1989	18	1.8
1990	13	1.1
1991	17	1.8
1992	19	2.2
1993	15	2.1
1994	17	2.3
1995	25	2.0
1996	7	2.1
1997	18	1.4
1998	16	1.4
1999	15	3.1
2000	21	2.1
2001	17	2.6
Average	15	1.9

Table 5 Residency of Unit 1A wolf trappers/hunters, 1990–2001

Regulatory year	Local resident ^a	Nonlocal resident ^b	Nonresident
1990	13	0	0
1991	16	1	0
1992	19	0	0
1993	15	0	0
1994	15	1	1
1995	25	0	0
1996	7	0	0
1997	15	2	1
1998	22	1	0
1999	44	1	1
2000	42	1	1
2001	42	0	2
Average	23	1	1

^a Local residents reside within the boundaries of Unit 1A.

^b Nonlocal residents are Alaska residents residing outside Unit 1A.

WOLF MANAGEMENT REPORT

From: 1 July 1999

To: 30 June 2002

LOCATION

GAME MANAGEMENT UNIT: Unit 1B (3,000 mi²)

GEOGRAPHIC DESCRIPTION: The Southeast Mainland from Cape Fanshaw to Lemesurier Point.

BACKGROUND

Wolves inhabit the mainland of Unit 1B, where they immigrated following post-glacial immigration and establishment of Sitka black-tailed deer populations. Deer are the primary food source for wolves in Southeast Alaska, with moose and mountain goat important in some mainland areas.

Wolf densities are higher in Unit 1B than in interior regions of Alaska, but due to dense forest cover viewing opportunities are infrequent.

Government wolf control programs and bounties were maintained into the 1970s in an effort to reduce wolf populations and increase deer numbers. Today a few recreational trappers and opportunistic hunters harvest wolves in the subunit.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Maintain a viable wolf population in all areas of historic range.

METHODS

We monitored the wolf harvest through a mandatory pelt-sealing program. We collected data on the number of wolves killed, sex, date of take, method of take, method of transportation used from home to the field, and the estimated number of wolves associated with the ones killed. The left foreleg was collected from each sealed wolf to determine relative age, beginning in regulatory year 1997.

We recorded observations of wolves made by ADF&G and US Forest Service biologists, trappers, hunters, and other members of the public. An annual statewide trapper survey supplied additional information.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

We collect insufficient data to make a meaningful estimate of the Unit 1B wolf population. Conversations with trappers, hunters, pilots, and other biologists and information from trapper questionnaires indicated the wolf population increased in the 1990s corresponding to an increase in deer.

MORTALITY

Harvest

Season and Bag Limit

Residents and Nonresidents

Trapping:	November 10–April 30	No limit
Hunting:	August 1–April 30	5 wolves

Board of Game Actions and Emergency Orders. There were no Board of Game actions or emergency orders issued during this report period.

Hunter/Trapper Harvest. In 1999–00, five individuals harvested 10 wolves, in 2000–01 eight individuals harvested 9 wolves, and in 2001–02 eight individuals harvested 19 wolves (Table 1). In 1999–00, adults comprised 60% of the harvest, and 20% of the harvest were adults in 2000–01 and 2001–02 (Table 2). Trapping continues to be the primary method of take. Deer and bear hunters and occasionally moose hunters are generally responsible for wolves that are shot incidental to hunting effort for these other species.

Most of the central Southeast Alaska wolf harvest takes place in close proximity to local communities in nearby Unit 3. The majority of the mainland is not trapped.

Harvest Chronology. In the 1999–00 season, January, October, and September, in descending order, accounted for the highest percent of the harvest (Table 3). In 2000–01, September, October and December, and January accounted for the highest percent of the harvest. In 2001–02, January, February, and April accounted for the highest percentage of the harvest. Wolves harvested in August and September are taken incidentally to other hunting activities.

Transport Methods. Trappers using small boats harvested all wolves reported taken during the report period (Table 4). No other methods of transportation have been reported to harvest wolves since 1994–95.

CONCLUSIONS AND RECOMMENDATIONS

The wolf harvest remains low in Unit 1B and much of the unit is not trapped. We recommend no change in regulations.

PREPARED BY:

Richard E. Lowell
Wildlife Biologist III

SUBMITTED BY:

Bruce Dinneford
Wildlife Biologist IV

Please cite any information taken from this section, and reference as:

Lowell, R. E. 2003. Unit 1B wolf management report. Pages 10–15 *in* C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 1B wolf harvest, 1988–01

Regulatory year	Reported harvest				Method of take			Successful trappers/hunters
	M	F	Unk.	Total	Trap/Snare	Shot	Unk.	
1988	4	5		9	6	3		6
1989	12	7		19	14	5		8
1990	7	8		15	10	5		3
1991	4	6		10	7	3		7
1992	3	5		8	7	1		2
1993	9	8		17	11	6		9
1994	11	5		16	14	2		8
1995	1	3		4	3	1		4
1996	2	2		4	2	2		4
1997	5	4		9	9	0		4
1998	6	7		13	8	5		6
1999	5	4	1	10	4	6		5
2000	5	4		9	4	5		8
2001	8	11		19	14	5		8

Table 2 Age of harvested Unit 1B wolves¹, 1997–01

Regulatory year	Adults	Subadults ²	% adults
1997	2	4	33
1998	6	5	55
1999	5	3	63
2000	1	4	20
2001	3	12	20

¹ Not all harvested wolves were aged.

² Less than 1 year of age.

Table 3 Unit 1B wolf harvest chronology, by percent by time period, 1988–01

Regulatory year	Harvest periods												n
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	
1988		11		11	11	56	11						9
1989			11	11	16	32	26			15			19
1990				13		7	40	13	26				15
1991		10			10	20	60						10
1992					12	50	26			12			8
1993		6		6	17	36	12	17		6			17
1994		6			6	57	19	6	6				16
1995					25	25		25	25				4
1996		25	25				25	25					4
1997						33	11	56					9
1998		15	8		8	23	38	8					13
1999			10	40			50						10
2000			33	22		22	12		11				9
2001		5	11				47	21		16			19

Table 4 Unit 1B wolf harvest, by percent by transport method, 1988–01

Regulatory year	Percent of harvest					n
	Airplane	Boat	3/4 wheeler	Snowmachine	Other	
1988	11	78		11		9
1989		89		11		19
1990		73	7	13	7	15
1991		90		10		10
1992		100				8
1993	6	88		6		17
1994	6	94				16
1995		100				4
1996		100				4
1997		100				9
1998		100				13
1999		100				10
2000		100				9
2001		100				19

WOLF MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2002

LOCATION

GAME MANAGEMENT UNIT: 1C (6500 mi²)

GEOGRAPHIC DESCRIPTION: That portion of the Southeast Alaska mainland from Cape Fanshaw to the latitude of Eldred Rock

BACKGROUND

Wolves are distributed throughout Unit 1C, but anecdotal evidence suggests they primarily inhabit major mainland river drainages. An exception is in the Chilkat Mountains and the Gustavus Forelands where wolves appear to be uniformly distributed, probably due to the presence of moose. During the report period we received reports of packs in the Gustavus Forelands, Endicott River, St. James Bay, Point Couverden, Berners Bay, Nugget Creek, Taku River, Snettisham Inlet, and Endicott Arm areas. Also, a pack of at least seven wolves was seen routinely during summer 2001 on the southwest side of Douglas Island, and a single wolf pup was found dead near the Eaglecrest Ski area in September 2001. There is no evidence that wolves occur on Shelter, Lincoln, or Sullivan islands.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

No formal wolf management goals have been established for this unit, however our general management objectives are to regulate seasons and bag limits to maintain populations of wolves for viewing and harvest. Our management strategy is to maintain wolf harvests at a level similar to the mean for the previous 5 seasons. No wolf control is contemplated for this area at this time.

METHODS

We collected the following data through mandatory sealing of wolf hides taken by successful hunters and trappers: date and method of take, sex, transportation mode, and number of animals in the pack. We also required hunters and trappers to leave the lower front leg bones attached to the hide for sealing. We used these bones to separate wolves into 3 age categories, juveniles (less than 1 year of age), subadults, and adults. The population was monitored by whatever means available, including anecdotal reports, aerial sightings incidental to surveys

of other species, discussions with hunters and trappers, and information collected from the annual statewide trapper surveys.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

We collected insufficient data to make meaningful estimates of wolf populations within the unit. Although no quantitative data is available, anecdotal reports and discussions with local hunters, trappers, and pilots as well as harvest data suggest wolf numbers are stable or slowly increasing. Wolves appear to be increasing on the Gustavus Forelands and within the Chilkat Range where moose have become more abundant over the past 10–20 years. For the first time in more than 20 years, wolves were documented on Douglas Island and produced at least 6 pups.

We gathered pack size information on sealing forms to gain some insight into the number of wolves present. Pack sizes ranged from one to 12 wolves, with a mean pack size of 5.5 wolves.

MORTALITY

Harvest

Seasons and Bag Limits

Hunting:	August 1–April 30	5 Wolves
Trapping:	November 10–April 30	No Limit

Board of Game Actions and Emergency Orders. There were no Board of Game actions or Emergency Orders issued during the report period.

Hunter/Trapper Harvest. Five wolves (3 males, 2 females) were harvested in 1999 (Table 1), 3 from Nugget Creek near the Mendenhall Glacier, 1 from the Gustavus Forelands, and one from Cape Fanshaw. This was slightly lower than the previous 10-year mean harvest of 6.8 wolves (range = 4–12). In 2000, the harvest of 12 wolves (4 males, 8 females) equaled the previous high harvest from 1989. Five of the wolves were from the Chilkat Mountains, 4 from Gustavus, and 3 from Nugget Creek. In 2001, 13 wolves (6 males and 7 females) were harvested (one male wolf was found dead and brought in for sealing). This total of 14 wolves was the highest recorded since 1988, and was the first time in at least 25 years that wolves were harvested from Douglas Island. Eight of the wolves sealed were from Douglas Island, 4 from the Chilkat Mountains, and 2 from the Cape Fanshaw area.

The combined harvest for 1999–2001 was 30 wolves, composed of 8 (27%) taken in snares, 16 (53%) taken with traps, and 6 (20%) taken with firearms. Pelt colors included 19 gray and 11 black wolves.

Hunter/Trapper Residency and Success. In 1999, 2 residents of the unit harvested 4 of 5 wolves that were taken. In 2000 the effort was more distributed, with 5 unit residents taking all 12 wolves. In 2001, 10 of the wolves harvested were taken by unit residents, and 3 by non-local residents.

Harvest Chronology. Trapping harvest is spread throughout the season, with the exception of summer months, and is not consistent from year to year (Table 2). Most recent harvest has occurred from January through March.

Transport Methods. Highway vehicles and boats were the primary access modes for wolf hunters and trappers (Table 3).

Other Mortality

A juvenile male wolf was found dead on Douglas Island during October 2001. This wolf was brought into ADF&G for sealing; the animal had no apparent wounds.

CONCLUSIONS AND RECOMMENDATIONS

Little is known about Unit 1C wolf populations. Reports from people afield and incidental observations by ADF&G staff indicate that wolves are common throughout the unit except for some smaller islands. During the report period the presence of wolves on Douglas Island was met with public emotion ranging from excitement to horror. One trapper harvested what appeared to be an entire pack of wolves, and caused uproar in Juneau over what many perceived as unethical and non-sustainable trapping practices.

Mountain goats and moose are the most common big game prey species in the unit, and the effect of wolves upon these populations may be considerable. Low mainland deer densities are likely due in part to wolf predation.

Although the wolf harvest increased to higher levels during 2000 and 2001, overall there is little effort exerted toward taking wolves in this unit, and the harvest remains well below the level that would negatively influence the population. No changes in seasons or bag limits are recommended at this time.

PREPARED BY:

Neil L. Barten
Wildlife Biologist III

SUBMITTED BY:

Bruce Dinneford
Wildlife Biologist IV

Please cite any information taken from this section, and reference as:

Barten, N. L. 2003. Unit 1C wolf management report. Pages 16–21 in C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 1C wolf harvest chronology, 1988–2001

Regulatory year	Males	Females	Unknown	Total
1988	3	2	0	5
1989	4	7	1	12
1990	4	2	0	6
1991	1	4	0	5
1992	3	2	0	5
1993	3	4	0	7
1994	4	1	2	7
1995	2	3	0	5
1996	5	3	0	8
1997	6	3	0	9
1998	1	2	1	4
1999	3	2	0	5
2000	4	8	0	12
2001	7	7	0	14
Mean annual harvest	3.6	3.6	0.3	7.4

Table 2 Unit 1C wolf harvest chronology by month, 1988–2001

Regulatory year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1988									5			
1989				1	1	5	3	1		1		
1990			1			3				1	1	
1991			2							2	1	
1992					1		1		2	1		
1993							2	3	1	1		
1994			2	2		1		1	1			
1995		1		1		2			1			
1996					1		3	3	1			
1997			1				6	1	1			
1998								3		1		
1999			1					3	1			
2000			1				1	4	3			
2001				2			7	2	3			
Mean annual harvest	0	0.7	0.6	0.4	0.2	0.8	1.6	1.5	1.4	0.5	0.1	0

Table 3 Unit 1C wolf harvest, percent by transport method, 1988–2001

Regulatory year	Airplane	Dogsled, skis, snowshoes	Boat	3- or 4- wheeler	Snow- machine	ORV	Hwy vehicle	Unknown
1988			50		50			
1989			84		8		8	
1990			83				17	
1991	40		60					
1992			80				20	
1993			100					
1994		14	86					
1995			20			40	40	
1996	44		56					
1997	100							
1998	75						25	
1999	20		20				60	
2000		8		8	25	25	34	
2001			86	7			7	

WOLF MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2002

LOCATION

GAME MANAGEMENT UNIT: 1D (2700 mi²)

GEOGRAPHIC DESCRIPTION: That portion of the Southeast Alaska mainland lying north of the latitude of Eldred Rock, excluding Sullivan Island and the drainages of Berners Bay

BACKGROUND

We have not conducted wolf investigations in this unit, and population information is based upon anecdotal information, sightings made during aerial moose and goat surveys, and discussions with hunters and trappers. Unlike much of Southeast Alaska, few deer are present in this unit and thus are not an important prey source for wolves. The most likely major prey species are moose, mountain goats, and beaver. The beaver population has increased over the past decade and probably represents a much greater portion of wolves' diet than in the past.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

No formal management goals have been established for wolves in this unit. However, our general management objectives are to regulate seasons and bag limits to maintain populations of wolves for viewing and harvest. Our management strategy is to maintain wolf harvests at a level similar to the mean over the previous 5 seasons. No wolf control methods are planned at this area at this time.

METHODS

Through the mandatory sealing of wolves taken by successful hunters and trappers we collected the following data: date and method of take, sex, transportation mode, and number of animals in the pack. We also required hunters and trappers to leave the lower front leg bones attached to the hide for sealing. We used these bones to separate wolves into 3 age categories; juveniles (less than 1 year of age), subadults, and adults. The population was monitored by whatever means were available, including anecdotal reports, aerial survey sightings, discussions with trappers and hunters, and information collected from the annual statewide trapper survey. Alaska Department of Fish & Game and Fish and Wildlife Protection staff sealed wolves in Haines.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

We collected insufficient data to make meaningful estimates of wolf populations within the unit. Although no quantitative data is available, anecdotal reports and discussions with local hunters, trappers, and pilots suggest wolf numbers are stable.

MORTALITY

Harvest

Seasons and Bag Limits

Residents and Nonresidents

Hunting:	August 1–April 30	5 Wolves
Trapping:	November 10–April 30	No Limit

Board of Game Actions and Emergency Orders. No Board of Game actions were taken or emergency orders concerning wolves were issued for this unit during the report period.

Hunter/Trapper Harvest. During the 1999 regulatory year 7 wolves (3 males, 4 females) were harvested in Unit 1D (Table 1). In 2000, 6 wolves (3 males, 2 females, 1 of unknown sex) were taken, and the 2001 harvest was 3 wolves (2 males, 1 female).

As in past years, far more wolves were taken by shooting than by trapping during the report period. The combined harvest for 1999–2001 was 16 wolves, composed of 10 (62%) harvested with firearms, 4 (25%) harvested with traps or snares, and 2 (13%) killed by a guided bow hunter. The color of wolves killed during this period was 2 white, 7 gray, and 7 black. At least half of the 3-year harvest was taken along the Chilkat River, which hunters access via the Haines Highway. The ease of sighting wolves along the open river valleys of the Chilkat and other large drainages in the unit likely increases the chances of their being harvested by firearms. Over a 3-year period, the harvest was composed of 9 adults and 5 juveniles; not all animals were aged.

Harvest Chronology. There was no pattern to harvest timing during the report period (Table 2), and numbers are so low that the harvest of a few wolves by one individual could affect the harvest chronology. Guided bear hunters killed at least 3 wolves during this report period, all taken in the fall.

Transport Methods. Access methods used by trappers and hunters who took wolves during the report period show little year-to-year consistency (Table 3). Because the harvest is small and few hunters and trappers are represented in more than a single year, inconsistency is not surprising. Again, one or two individuals focusing on hunting or trapping in the subunit could dominate the harvest data.

Other Mortality

No natural mortality was documented during the report period. One wolf trapper caught a small, emaciated black bear, in a Conibear trap in January 2002; the skull and hide were sealed and surrendered to the state.

CONCLUSIONS AND RECOMMENDATIONS

The status of the Unit 1D wolf population is uncertain. Little effort is made to take wolves in the area, but with fewer moose in the Chilkat Valley than in the past, any noticeable predation raises public concern. Anecdotal reports of increased wolf numbers in the unit do not correlate with higher numbers of animals being trapped. Balanced against this are nonconsumptive values that wolves may offer. Wolf management planning in 1991 and 1992 showed most local respondents preferred no wolf control and some even recommended no harvest of wolves. No changes in seasons or bag limits are recommended at this time.

PREPARED BY:

Polly Hessing
Wildlife Biologist II

SUBMITTED BY:

Bruce Dinneford
Wildlife Biologist IV

Please cite any information taken from this section, and reference as:

Hessing, P. 2003. Unit 1D wolf management report. Pages 22–27 in C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 1D wolf harvest chronology, 1988–2001

Regulatory year	Males	Females	Unknown	Total
1988	0	1	0	1
1989	3	1	1	5
1990	0	1	0	1
1991	0	0	0	0
1992	0	3	0	3
1993	1	0	0	1
1994	1	1	0	2
1995	1	2	0	3
1996	4	4	0	8
1997	3	0	0	3
1998	1	2	1	4
1999	3	4	0	7
2000	3	2	1	6
2001	2	1	0	3
Average	2	2	<1	3

Table 2 Unit 1D wolf harvest chronology, 1988–2001

Regulatory year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1988						1						
1989				3		1			1			
1990					1							
1991												
1992						1	2					
1993				1								
1994					1				1			
1995				1					1	1		
1996			2				2				4	
1997				1	1		1					
1998						2	1		1			
1999			2		1		1	1	2			
2000			1	1			2	1			1	
2001		1							1	1		
Average		.1	.4	.5	.3	.4	.16	.1	.5	.5		

Table 3 Unit 1D wolf harvest, percent by transport method, 1988–2001

Regulatory year	Airplane	Dogsled, skis, & snowshoes	Boat	3- or 4- wheeler	Snow- machine	ORV	Highway vehicle	Unknown
1988			100					
1989				20	20		60	
1990							100	
1991								
1992	67						33	
1993			100					
1994							100	
1995					33		33	33
1996			43		14		43	
1997		25	25				50	
1998		25			25		50	
1999		29	28					
2000		17	33	17			17	16
2001		33	33		34			

WOLF MANAGEMENT REPORT

From: 1 July 1999

To: 30 June 2002

LOCATION

GAME MANAGEMENT UNIT 2: (3,600 mi²)

GEOGRAPHIC DESCRIPTION: UNIT 2 - Prince of Wales and adjacent islands south of Sumner Strait and west of Kashevarof Passage.

BACKGROUND

Wolves live throughout Unit 2, and densities on Prince of Wales (POW) and adjacent islands are generally higher than on the nearby Unit 1A mainland. Wolves are capable swimmers and regularly travel between adjacent islands in search of prey. Movements between Unit 2 and the mainland are much less frequent.

Wolves feed primarily on deer in southern Southeast Alaska, and Unit 2 wolves depend on deer for the majority of their diet. Black bears are occasionally killed by wolves, but probably provide a small portion of their diet. Marine mammals, salmon, waterfowl, and small mammals supplement wolves' diets in the area.

The coloration of Southeast Alaska wolf pelts varies; however, the brown/gray color is most common. During the past decade, white or near-white pelts have comprised less than 1% of the harvest while black pelts have accounted for about 8–10% of the unit's harvest.

From 1915 through the early 1970s, a cash bounty was paid for wolves killed in Southeast Alaska, and in the 1950s Federal agents poisoned wolves in the region in an attempt to increase or maintain deer numbers. None of these programs had long-lasting effects on wolf abundance or distribution. In 1990, Southeast Alaska wolves (named by some taxonomists as the Alexander Archipelago wolf) were identified by a USDA Forest Service-sponsored interagency committee as a species for which there were concerns about viability or distribution as a result of extensive timber harvesting on the Tongass National Forest. In 1993, the Biodiversity Legal Foundation (Boulder, CO) and an independent biologist from Haines, Alaska, filed a petition with the U. S. Fish and Wildlife Service (FWS) requesting that Southeast wolves be listed as a threatened subspecies pursuant to the Endangered Species Act. The FWS ruled that listing was not warranted, but indicated that without significant changes to the existing Tongass Land Management Plan the long-term viability of Southeast wolves was seriously imperiled. A comprehensive conservation assessment was subsequently prepared through the USDA Forest Service (Person et al. 1996). The most important consideration identified in the assessment was the need to maintain long-term carrying

capacity for deer, the principal prey for wolves in the region. The authors suggested that a series of old-growth forest reserves could provide an effective strategy to increase the persistence of wolves where extensive timber harvesting had occurred or was planned. In 1996 the Board of Game (Board) adopted a harvest cap of 25% of the annual Unit 2 wolf population estimate, effective with the 1997–98 hunting and trapping season. In fall 1999 the Unit 2 wolf population was estimated at about 350 wolves. The harvest guideline was reached during the 1999–00 trapping season and an emergency order was issued closing the remainder of the hunting and trapping season February 29, 1999.

MANAGEMENT OBJECTIVES

Our objectives are to maintain an average annual harvest of at least 39 wolves from Unit 2. This reflects the average harvest for this unit during 1984–1990.

METHODS

We obtained harvest information through a mandatory sealing program. Throughout Southeast the left foreleg must remain attached to the hide until sealed for aging purposes. Information obtained from hunters and trappers included the number and sex of harvested wolves, date and location of harvest, method of take, transportation used, and pelt color. We obtained anecdotal information about wolves from hunters and trappers as well as from department staff. Additional information was obtained from trappers through an annual mailout survey. We also obtained information from research programs on both Heceta Island and POW looking at predator-prey relationships.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Using a simulation model based on data collected through a graduate research project in Unit 2, Person and Ingle (1995) estimated that 321 wolves (SE = 135) inhabited POW and Kosciusko islands during autumn 1994, and 199 wolves (SE = 111) during spring 1995. The smaller spring estimate reflected overwinter mortality, primarily from trapping (Table 1). No current data of a similar nature is available, nor are subsequent estimates available. Consistently high harvests during the past 5 seasons suggest that wolves have remained relatively abundant, although declines in the indices of abundance suggest that the population may have declined slightly during the past 3 seasons (Kephart 2000).

Pack sizes on POW and Kosciusko islands were larger in early autumn before trapping season, averaging 7 to 9 wolves (Person and Ingle 1995). An entire wolf pack is rarely observed except during winter, thus pack sizes are difficult to estimate unless repeated direct observations are made (Person et al. 1996).

Distribution and Movements

On POW and Kosciusko islands, Person et al. (1996) reported average home ranges of 109 mi². Core areas where wolf activity was concentrated averaged 48 mi², or 55 to 60% smaller than total home ranges.

Pups that survive to adulthood either remain in their natal packs or disperse. In wolf populations with high mortality, lone wolves may be more successful at finding vacant territories to occupy or being accepted into established packs (Ballard et al. 1987). Dispersing wolves are more vulnerable than non-dispersers to hunting and trapping and are also more likely to be killed by other wolves (Peterson et al. 1984).

MORTALITY

Harvest

<u>Season and Bag Limit</u>	<u>Resident and Nonresident</u>	
Hunting:	December 1–March 31	5 wolves
Trapping:	December 1–March 31	no limit

Game Board Actions and Emergency Orders. During fall 1996 the Board considered a petition to list the Alexander Archipelago wolf as a threatened subspecies. The Board adopted a shorter trapping and hunting season for Unit 2. Effective July 1, 1997 the hunting and trapping season was changed from August 1–April 30 to December 1–March 31. The Board also imposed a harvest cap of 25% of the unit's fall population estimate. A harvest in excess of the guideline was determined to be non-sustainable in the long term and could lead to a population decline. The 1999 fall population, based on population modeling augmented by radiotelemetry and demographic data, was estimated at about 350 wolves. A harvest of 80–90 wolves would represent about 25% of the fall population. To provide more hunting and trapping opportunity, avoid emergency order closures, and improve harvest reporting, in fall 2000 the Board increased the harvest cap to 30% of the fall population estimate. Many wolves trapped in Unit 2 during the season have poor pelt quality. They are discarded and consequently not sealed. Increasing this harvest cap will hopefully capture some of the unreported harvest.

The 1999–00 season was the first time the harvest reached a Board-established guideline, and the season was closed on February 29 by emergency order. In 1999–00 there was an increase in successful trappers – several new trappers worked Unit 2 with good success – whereas historically 3 or 4 trappers took more than 10 wolves each. After that season the number of productive trappers reverted to the long-term norm, with 2 trappers in 2000 and 2001 and 3 trappers in 1999 that caught more than 10 wolves per season.

Hunter/Trapper Harvest. The Unit 2 wolf harvest has shown a steady decline during the past 3 years. From 1999–2001 the total harvest was 96, 73, and 58 respectively (Table 1). The annual harvest ranged from a 1985 low of 18 to a high of 132 wolves in 1996. During the report period the number of successful trappers fell to a 3-year average of 17, well below the 10-year average of 27 (range 16–37). The number of trappers reached a high of 42 in 1990 and a low of 14 during the 1985 season. Average wolf harvest per trapper has ranged from a

low of 1.1 in 1989, to a high of 5.5 during 1999 (Table 4). The number of active trappers is down from a long-term average of 28 with an average catch of 2.8 wolves each. As the human population continues to decline in Unit 2, mostly because of fewer timber related jobs, we expect to see fewer trappers, yet similar success by the remaining resident trappers.

About 92% of the wolves harvested during the past 3 seasons were caught in traps or snares, while the other 8% were shot, well below the long-term average of 28% shot (Table 1).

The sex ratio of harvest during the past 18 years has remained almost evenly split at an average of 54% male and 42% female. During the current report period males accounted for 52% of the harvest (Table 1).

Hunter Residency and Success. Nonlocal residents have accounted for 34% of the hunters and trappers who took wolves in Unit 2 during the past 13 years. However, during this report period there were no wolves taken by nonlocals, and nonresidents took only 4% (Table 5).

Harvest Chronology. Wolf harvests are affected by local weather conditions. Persistent freezing often makes intertidal sets inoperative and deep snow can bury snares and trail sets rendering them useless. Typically the Unit 2 harvest has been highest during December and January. However, during the past 2 years the majority of wolves were taken during January (26%) and February (22%).

During the past 10 years (1992–2002), 17% of the harvest has been taken by shooting (both by trappers and hunters). Fewer wolves have been taken with firearms since the season dates for hunting and trapping changed July 1, 1997, from August 1–April 30 to December 1–March 31. We believe the reduction in the number of wolves shot was due to the elimination of opportunistic kills during fall deer hunts when many hunters are afield.

Transport Methods. Highway vehicles and boats account for the majority of transport methods used by successful Unit 2 wolf hunters and trappers. Highway vehicles accounted for 28% and boats 47% of the transport methods used to harvest wolves during the past 3 years (Table 2).

Other Mortality

Mortality from natural causes (starvation, accidents, disease, fighting) in exploited populations is low, typically averaging 5 to 10% per year (Fuller 1989). We believe that in Unit 2 substantial mortality results from unreported killing of wolves (Person et al. 1996). Of 17 radiocollared wolves on POW that died during a 3-year study, humans legally killed 53%, 29% were killed by humans but not reported, and 18% died from natural causes. Considering the additive effects of natural and unreported mortality, total mortality could be 35 to 50% higher than reported, although some bias may exist against reporting legally killed wolves with radio collars. Regardless, we believe that reported mortality substantially underestimates total Unit 2 wolf mortality.

HABITAT

Assessment

As we have reported previously (Wood 1990, Larsen 1991) and as Person et al. (1996) reiterated recently, the expanding Unit 2 road system and increasing human population will continue to have a direct effect on wolves. We expect long-term reductions in wolf numbers as a result of deer declines through habitat loss. As the uneven-aged old growth forest is logged, deer carrying capacity will be reduced, and consequently wolf populations will decline as well. To mitigate the effects of habitat loss, Person et al. (1996) suggested maintaining large, unfragmented and unroaded blocks of habitat within biogeographic areas where extensive timber harvesting has occurred, or where extensive harvesting is planned. The authors believe that making old growth reserves large enough to encompass the core activity areas of at least one wolf pack would markedly increase the likelihood of the reserves effectiveness and reduce the long-term risk to wolf viability. Work is ongoing to define and designate appropriate old growth reserves in Unit 2.

CONCLUSIONS AND RECOMMENDATIONS

We believe that wolf populations have decreased slightly in Unit 2 during this report period. Although we do not consider wolves threatened in southern Southeast Alaska at this time, we have conservation concerns stemming from long-term habitat changes, human population growth, and increased roaded access into once remote wolf habitats. We support the concept of establishing roadless reserves within logged areas. Current old growth reserves appear to be providing some temporary refugia for wolves and work is ongoing to identify and establish viable old growth reserves across the unit. Few wolves have been recently harvested in existing reserves due to limited access during trapping season.

The number of Unit 2 trappers who successfully catch wolves is declining, perhaps mirroring the slowly declining local human population. The remaining trappers are among the more serious and skilled, and they continue to catch a similar number of wolves each year. Fur market prices, and consequently incentives to trap, remain about the same.

By shortening the trapping season to coincide with the period of maximum pelt primeness (December 1–March 31) the Board has reduced the annual wolf harvest by an estimated 12%. Current regulations relieve some concern about harvesting wolves beyond a sustainable level in a unit where habitat changes and increased access are an issue.

We continue to be concerned about under-reporting of wolves killed that are during the season but not officially sealed.

LITERATURE CITED

- BALLARD, W. B., J. S. WHITMAN, AND C. L. GARDNER. 1987. Ecology of an exploited wolf population in south-central Alaska. Wildl. Monog. 98.
- FULLER, T. 1989. Population dynamics of wolves in north-central Minnesota. Wildl. Monog. 105.

- KEPHART, J. 2000. Trapper Questionnaire. Alaska Dep Fish and Game. Statewide Annual Report. Juneau, Alaska USA.
- LARSEN, D. N. 1991. Survey-inventory wolf management report. Pages 1-9 *in* S. M. Abbott, ed. Fed. Aid Wildl. Rest. Proj. W-23-3 and W-23-4, Study 14.0. Juneau.
- PERSON, D. K., AND M. A. INGLE. 1995. Ecology of the Alexander Archipelago wolf and responses to habitat change. Unpubl. prog. rep. 3. On file with Alaska Dep. Fish and Game. Douglas.
- _____, AND M. KIRCHHOFF, V. VAN BALLEMBERGHE, G. C. IVERSON, AND E. GROSSMAN. 1996. The Alexander Archipelago wolf: a conservation assessment. USDA For. Ser. Gen. Tech. Rep. PNW-GTR-384. Portland.
- PETERSON, R. O., J. D. WOOLINGTON, AND T. N. BAILEY. 1984. Wolves of the Kenai Peninsula, Alaska. Wildl. Monog. 88.
- WOOD, R. E. 1990. Annual survey-inventory wolf management report. Pages 1-7 *in* S. O. Morgan, ed. Fed. Aid Wildl. Rest. Proj. W-23-2, Study 14.0. Juneau.

PREPARED BY:

Boyd Porter
Wildlife Biologist III

SUBMITTED BY:

Bruce Dinneford
Wildlife Biologist IV

Please cite any information taken from this section, and reference as:

Porter, B. 2003. Unit 2 wolf management report. Pages 28–38 *in* C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 2 wolf harvests, 1985–2001

Regulatory					Method of take			Pelt color			
year	Males	Females	Unk	Total	Shot	Trapped	Unk	White	Grey	Black	Unk
1985	7	11	0	18	9	9	0	1	14	3	0
1986	22	16	1	39	16	23	0	0	32	7	0
1987	27	24	4	55	26	29	0	1	39	15	0
1988	27	16	2	45	31	14	0	0	41	4	0
1989	20	11	1	32	23	8	1	0	20	9	3
1990	36	29	1	66	44	21	1	0	50	15	1
1991	42	40	4	86	41	45	0	0	80	6	0
1992	59	46	0	105	26	79	0	0	93	11	1
1993	46	54	3	103	21	81	1	0	80	15	8
1994	50	32	3	85	21	64	0	0	82	2	1
1995	62	41	0	103	35	68	0	0	90	12	1
1996	82	30	0	132	24	108	0	0	118	14	0
1997	49	31	0	80	8	72	0	1	66	4	9
1998	44	47	0	91	10	79	2	0	90	1	0
1999	49	47	0	96	10	86	0	0	78	15	0
2000	36	37	0	73	9	63	0	0	69	4	0
2001	32	26	0	58	0	58	0	0	57	1	0
Average	41	32	1	75	21	53	0	0	65	8	1

Table 2 Unit 2 wolf hunter/trapper transport methods, 1985–2001

Regulatory year	Air	Boat	Highway ^a vehicle	Walked	Unknown
1985	0	4	5	0	9
1986	0	14	25	0	0
1987	0	31	20	0	4
1988	2	25	15	0	3
1989	0	12	15	0	5
1990	2	15	40	1	8
1991	2	53	31	0	0
1992	1	68	32	0	4
1993	1	59	42	0	1
1994	1	57	25	2	0
1995	3	60	39	0	1
1996	0	44	86	1	1
1997	0	51	29	0	0
1998	1	41	47	0	0
1999	0	64	30	0	0
2000	0	45	28	0	0
2001	0	33	25	0	0
Average	1	40	31	0	2

^a Includes 3 or 4 wheelers and other off road vehicles.

Table 3 Unit 2 wolf harvest chronology, 1985–2001

Regulatory year	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
1985	0	0	4	1	2	2	3	4	1	1	0	0
1986	0	1	1	1	2	11	6	9	5	2	1	0
1987	0	1	1	7	7	11	3	11	8	1	4	1
1988	0	0	5	8	5	8	5	4	0	3	4	3
1989	0	2	3	3	2	5	3	2	2	2	4	4
1990	0	4	4	8	7	6	7	12	12	6	0	0
1991	1	2	7	1	8	20	18	7	7	11	2	2
1992 ^a	0	1	3	8	10	19	15	16	28	4	1	0
1993	0	1	2	6	11	24	33	16	8	2	0	0
1994	0	1	2	4	4	22	18	19	12	3	0	0
1995	0	2	8	8	1	15	22	19	27	1	0	0
1996 ^b	0	3	7	7	2	12	26	51	21	3	0	0
1997	0	0	0	0	0	20	27	30	3	0	0	0
1998	0	0	0	0	0	32	26	17	16	0	0	0
1999	0	0	0	0	1	28	26	34	0	0	0	0
2000	0	0	0	0	0	12	28	19	14	0	0	0
2001	0	0	0	0	0	14	24	14	7	0	0	0
Average	0	1	3	4	4	15	17	17	10	2	1	1

^a Hunting season changed from year round, no limit, to August 1–April 30, 5 wolf limit.

^b Hunting and trapping seasons changed from August 1–April 30 to December 1–March 31.

Table 4 Numbers of trappers who caught wolves in Unit 2, and average catch per trapper, 1985–2001

Regulatory year	Number of trappers that harvested wolves	Average catch/trapper
1985	14	1.3
1986	27	1.4
1987	34	1.6
1988	31	1.4
1989	28	1.1
1990	42	1.6
1991	37	2.3
1992	35	3.0
1993	30	3.4
1994	37	2.3
1995	38	2.7
1996	36	3.7
1997	21	3.8
1998	19	4.8
1999	17	5.5
2000	19	3.8
2001	16	3.6
Average	28	2.8

Table 5 Residency of Unit 2 wolf trappers/hunters, 1990–2001

Regulatory year	Local resident ^a	Nonlocal resident ^b	Nonresident
1990	24	18	0
1991	19	15	3
1992	18	16	1
1993	24	6	0
1994	24	11	2
1995	18	20	0
1996	30	5	1
1997	18	3	0
1998	19	0	0
1999	17	0	1
2000	19	0	1
2001	16	0	0
Average	21	8	1

^a Local residents reside within the boundaries of Unit 2.

^b Nonlocal residents are Alaskans residing outside Unit 2.

WOLF MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2002

LOCATION

GAME MANAGEMENT UNIT: Unit 3 (3,000 mi²)

GEOGRAPHIC DESCRIPTION: Islands of the Petersburg, Wrangell, and Kake area.

BACKGROUND

Wolves inhabit Unit 3 islands where they immigrated following post-glacial immigration and establishment of Sitka black-tailed deer populations. Deer are the primary food source for wolves in Southeast Alaska, with moose important in some areas.

Wolf densities are higher in Unit 3 than in interior regions of Alaska, but due to the dense forest cover viewing opportunities are limited.

Government wolf control programs and bounties were maintained into the 1970's in an effort to increase deer numbers. Today a few recreational trappers and opportunistic hunters harvest wolves.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Maintain a viable population in all areas of historic wolf range.

METHODS

We monitored the wolf harvest through a mandatory pelt-sealing program. We collected data on the number of wolves killed, sex, date of take, method of take, method of transportation used from home to the field, and the estimated number of wolves associated with those killed. We collected the left foreleg from each sealed wolf to determine age.

We recorded observations of wolves made by ADF&G and US Forest Service biologists, trappers, hunters, and other members of the public. An annual statewide trapper survey supplied additional information.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

We collected insufficient data to make a meaningful estimate of wolf populations. Conversations with trappers, hunters, pilots, and other biologists along with information from trapper questionnaires indicated the wolf population increased during the 1990's corresponding to the increase in deer numbers.

MORTALITY

Harvest

<u>Season and Bag Limit</u>	<u>Residents and Nonresidents</u>	
Trapping:	November 10–April 30	No limit
Hunting:	August 1–April 30	5 wolves

Board of Game Actions and Emergency Orders. There was no pertinent Board of Game actions or emergency orders issued during this report period.

Hunter/Trapper Harvest. In regulatory year 1999–00, 28 individuals harvested 57 wolves, in 2000–01 35 individuals harvested 59 wolves, and in 2001–02 29 individuals harvested 51 wolves (Table 1). In 1999–00 adults comprised 41% of the kill, in 2000–01 48% were adults, and in 2001/02 32% were adults (Table 2).

Except for the 1998–99 season, trapping has been the primary method of taking wolves in Unit 3. Trapping accounted for 60%, 66% and 67% of the harvest in 2000, 2001, and 2002, respectively. Deer hunters, bear hunters, and occasionally moose hunters are generally responsible for wolves that are shot incidentally as they pursue these other species.

Most of the wolf harvest takes place in proximity to local communities. The majority of Unit 3 is not trapped for wolves.

Harvest Chronology. In 1999–00, February, January, and March, in descending order, accounted for the highest percent of the harvest (Table 3). February, December, January, and April accounted for the highest percentage of the harvest in 2000–2001. In 2001–02, January, February, and March accounted for the highest percent of the harvest.

Transport Methods. During the report period trappers using small boats harvested the majority of wolves (Table 4). Some trapping occurs from the road system on Mitkof and Wrangell islands. Other forms of transportation are rarely used.

CONCLUSIONS AND RECOMMENDATIONS

Wolf populations and harvest have both increased in recent years. Much of Unit 3 is not trapped. We recommend no change in regulations.

PREPARED BY:

Richard E. Lowell
Wildlife Biologist III

SUBMITTED BY:

Bruce Dinneford
Wildlife Biologist IV

Please cite any information taken from this section, and reference as:

Lowell, R. E. 2003. Unit 3 wolf management report. Pages 39–44 *in* C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 3 wolf harvest, 1988–2001

Regulatory year	Reported harvest				Method of take			Successful trappers/hunters
	M	F	Unk.	Total	Trap/snare	Shot	Unk.	
1988	5	5	0	10	5	5	0	6
1989	12	10	0	22	12	10	0	13
1990	11	7	0	18	15	3	0	10
1991	26	25	0	51	33	17	1	25
1992	12	14	0	26	19	7	0	13
1993	27	19	2	48	37	11	0	20
1994	31	23	0	54	38	16	0	15
1995	27	13	0	40	26	13	1	20
1996	32	27	0	59	43	16	0	24
1997	25	16	2	43	29	14	0	23
1998	16	18	0	34	16	18	0	22
1999	29	28	0	57	34	23	0	28
2000	33	25	1	59	38	20	1	35
2001	26	25	0	51	32	17	2	29

Table 2 Age of Unit 3 harvested wolves¹, 1997–2001

Regulatory year	Adults	Subadults ²	% adults
1997	22	16	58
1998	15	11	58
1999	17	24	41
2000	24	26	48
2001	14	30	32

¹ Not all harvested wolves were aged.

² Less than 1 year of age.

Table 3 Unit 3 wolf harvest chronology, by percent by time period, 1988–2001

Regulatory year	Harvest periods													n
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	Unk	
1988	10	0	10	0	0	0	0	50	0	20	10	0	0	10
1989	0	9	9	16	0	32	13	4	13	4	0	0	0	22
1990	0	6	0	6	0	11	28	22	16	11	0	0	0	18
1991	0	0	8	8	14	8	15	15	12	10	6	4	0	51
1992	0	0	15	4	0	12	35	0	15	19	0	0	0	26
1993	0	4	4	9	4	27	20	10	13	9	0	0	0	48
1994	0	2	4	2	11	15	20	7	11	9	0	0	19	54
1995	0	2	5	13	8	23	12	18	15	2	2	0	0	40
1996	0	0	3	5	7	10	7	20	24	22	2	0	0	59
1997	0	0	7	9	9	7	19	26	9	14	0	0	0	43
1998	0	0	6	18	9	3	12	8	18	26	0	0	0	34
1999	0	3	1	16	5	1	18	22	18	16	0	0	0	57
2000	0	2	8	5	3	17	14	27	10	14	0	0	0	59
2001	0	2	12	6	2	6	21	21	16	12	2	0	0	51

Table 4 Unit 3 wolf harvest, by percent by transport method, 1988–2001

Regulatory year	Percent of harvest							n
	Airplane	Boat	3/4 wheeler	Snowmachine	ORV	Highway vehicle	Other	
1988	10	70	0	0	0	20		10
1989	0	77	5	0	0	18		22
1990	0	72	0	17	0	11		18
1991	4	69	0	0	0	22	6	51
1992	4	85	0	0	0	12		26
1993	4	81	0	0	0	13	2	48
1994	0	89	0	4	0	5	2	54
1995	0	85	0	0	0	13	2	40
1996	1	73	0	0	19	7		59
1997	2	85	2	0	2	9		43
1998	6	74	0	0	0	20		34
1999	4	68	0	0	5	23	0	57
2000	3	71	5	0	2	17	2	59
2001	0	73	0	0	0	25	2	51

WOLF MANAGEMENT REPORT

From: July 1, 1999
To: June 30, 2002

LOCATION

GAME MANAGEMENT UNIT: 5 (5800 mi²)

GEOGRAPHIC DESCRIPTION: Cape Fairweather to Icy Bay, eastern Gulf of Alaska coast

BACKGROUND

Lifelong residents of Yakutat report that wolves were present on the Yakutat Forelands prior to the immigration of moose in the early 1930s (ADF&G files). Klein (1965) suggested that wolves reached this area through the Alsek/Tatsenshini River valley. Interestingly, there were no reports of wolves on the west side of Yakutat Bay (Unit 5B) before 1971, well after moose were established there. However, based on anecdotal information, a viable wolf population was probably established there by 1976.

In winter 1977, Yakutat Area Wildlife Biologist R. Quimby estimated a minimum of 6 different wolf packs in Unit 5A, including the Situk, Ahrnklin, Dangerous/Italio, Akwe, Tanis Mesa/East Alsek, and Doame/Clear packs. He estimated minimum pack sizes of 9, 7, 6, 3, 5, and 6, respectively, for a total of 36 wolves. He extrapolated this to a minimum of 45–50 animals (pre-pupping), estimating a density of 1 wolf/15 mi². However, the presence of a breeding population of wolves in Unit 5B was undetermined at that time. In winter 1979, area wildlife biologist R. Ball estimated Unit 5A and 5B minimum populations at 35 and 10 wolves, respectively. By 1980 Ball felt wolf numbers were stable or increasing in Unit 5A, with a population estimate of 50 animals. By 1982 Ball suggested there might be a minimum of 12 wolves in Unit 5B in 2 packs. In 1985 B. Dinneford reported an increased number of accounts from local residents of moose mortality in winter months. These accounts may have reflected an increasing wolf population, responding to a larger moose population. Wolves probably subsisted mostly on mountain goats and salmon before the arrival of moose in the area. Salmon are considered very important for wolf maintenance, especially as a late fall/early winter food source.

Because of the decline in moose numbers and the apparent predation on moose by wolves, an attempt was made to reduce wolf numbers from 1974–76. This effort was unsuccessful, with only 1 wolf killed during 31 hours of aerial hunting. Bad weather, rough terrain, and dense forest prevented a higher take.

There have been no attempts in recent years to quantify wolf numbers in Unit 5. However, anecdotal evidence collected from discussions with local hunters and trappers, hunting guides, pilots, and local ADF&G personnel suggests that wolves are distributed throughout Unit 5.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

No formal management goals have been established for wolves in this unit, however general management objectives are to regulate seasons and bag limits to maintain populations of wolves for viewing and harvest. Our management strategy is to maintain wolf harvests at a level similar to the mean for the previous 5 seasons. No wolf control methods are contemplated for this area at this time.

METHODS

Through the mandatory sealing of wolves taken by successful hunters and trappers we collected the following data: date and method of take, sex, transportation mode, and number of animals in the pack. We also required hunters and trappers to leave lower front leg bones attached to the hide for sealing. We used these bones to separate wolves into 3 age categories: juveniles (less than 1 year of age), subadults, and adults. ADF&G staff in Yakutat sealed wolves. The population was monitored by whatever means available, including anecdotal reports, aerial sightings during surveys for other species, discussions with hunters and trappers, and information collected from the annual statewide trapper surveys.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

We collected insufficient data to make meaningful estimates of wolf populations within the unit. Although no quantitative data is available, anecdotal reports and discussions with local hunters, trappers, and pilots suggest wolf numbers are stable. Data we collected on pack size from hunters and trappers while sealing wolves ranged from 1–7 animals, with a mean pack size of 2.6 animals.

MORTALITY

Harvest

Seasons and Bag Limits

Residents and Nonresidents

Hunting:	August 1–April 30	5 Wolves
Trapping:	November 10–April 30	No Limit

Board of Game Actions and Emergency Orders. No Board of Game actions were taken or emergency orders issued for this unit during the report period.

Hunter/Trapper Harvest. Difficult travel conditions and inconsistent weather (heavy snows often changing to rain) in the Yakutat area restricts hunting and trapping effort for wolves.

Only 3 wolves (1 male and 2 females) were taken in Unit 5 during the 1999 regulatory year (Table 1). This equaled 1997 as the lowest harvest in the past 10 years, but is likely a reflection of reduced trapping effort more than a scarcity of wolves. One trapper took one of these wolves, while 2 were harvested by hunters while on moose and bear hunts. The 10-year mean for previous years is 10 wolves/year (range = 3–24). The low trapper harvest of wolves mirrors the overall low trapping effort in 1999 that resulted in one of the lowest furbearer harvests in many years. In 2000, the harvest increased to 11 wolves (4 males, 7 females), with 5 being trapped and seven taken by hunters. The 2001 harvest was 6 wolves (4 males, 2 females); only 2 were trapped while hunters shot 4.

In the past, trapping and snaring were the primary method of take. The combined harvest for 1999–2001 was 20 wolves, with only 8 (40%) taken in traps or snares, while 12 (60%) were taken by hunters. Fifteen of the wolves were gray, 2 were black, one was white, and 2 were of unknown color.

Hunter/Trapper Residency and Success. In 1999, 2 nonlocal residents and 1 nonresident accounted for the entire wolf harvest. This is the first year in many that Yakutat residents did not take any wolves, and is largely due to the absence of a single trapper who generally accounts for much of the Yakutat trapping effort. In 2000, 5 local residents, 3 nonlocal Alaskans, and 3 nonresidents accounted for the harvest. In 2001, 3 local residents, one nonlocal Alaskan, and 2 nonresidents reported taking wolves. All wolves harvested by nonresidents were shot, almost always while hunting other game.

Harvest Chronology. People hunting other species shot most wolves taken during fall months (Table 2). During the late winter and spring, however, the wolf harvest was mostly limited to trappers.

Transport Methods. During the report period successful trappers and hunters used varied transport modes, showing little consistency year to year (Table 3). Because of the small harvest, 1 or 2 serious trappers using consistent transport methods dominate this category.

Other Mortality

There was one wolf killed at Icy Bay logging camp in Unit 5B after it attacked a child. Information about this incident suggests this wolf was being fed by people in the camp.

CONCLUSIONS AND RECOMMENDATIONS

Our knowledge of Unit 5 wolf populations is limited to information provided by hunters, trappers, local pilots, trapper surveys, and incidental observations by Department of Fish and Game staff. From these data sources it appears that the wolf population is stable throughout the unit. Moose and mountain goat populations are doing well, and with the few deer and abundant beaver in the area, wolves do not lack for prey resources. Because of difficult access and inclement weather throughout the unit, hunting and trapping pressure on wolves will probably remain low. No changes in seasons or bag limits are recommended at this time.

LITERATURE CITED

KLEIN, DAVID R. 1965. Postglacial Distribution Patterns of Mammals in the Southern Coastal Regions of Alaska. *Arctic*, Vol. 18, No. 1. 4 pp.

PREPARED BY:

Neil L. Barten
Wildlife Biologist III

SUBMITTED BY:

Bruce Dinneford
Wildlife Biologist IV

Please cite any information taken from this section, and reference as:

Barten, N. L. 2003. Unit 5 wolf management report. Pages 45–51 *in* C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 5 wolf harvest, 1988–2001

Regulatory year	Males	Females	Unknown	Total
1988	3	5	0	8
1989	7	6	0	13
1990	4	3	0	7
1991	8	3	0	11
1992	2	2	0	4
1993	6	3	0	9
1994	10	2	3	15
1995	6	3	0	9
1996	8	16	0	24
1997	2	1	0	3
1998	4	3	0	7
1999	1	2	0	3
2000	4	7	0	11
2001	4	2	0	6
Mean annual harvest	4.9	4.1	0.2	9.3

Table 2 Unit 5 wolf harvest chronology by month, 1988–2001

Regulatory year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1988			2	1	1	1		2			1	
1989			4	1	1				1	2	4	
1990			1	1	1		1			1	2	
1991		2	1			1		3	3	1	2	
1992			1	1						2		
1993		1				1	2	1		4		
1994			2		1	3		3	3	2		
1995			1			1	2	1	3	1		
1996			3	2	2		4	1	11	1		
1997			1	1		1						
1998			2	3						2		
1999			1	1	1							
2000			2	1			2	1	2	3		
2001			3						2	1		
Mean annual harvest	0	0.2	1.7	0.9	0.5	0.6	0.9	0.9	1.8	1.4	0.6	0

Table 3 Unit 5 wolf harvest, percent by transport method, 1988–2001

Regulatory year	Airplane	Dogsled, skis, & snowshoes	Boat	3 or 4 wheeler	Snow- machine	ORV	Highway vehicle	Unknown
1988	88			12				
1989	38		8	15		8	31	
1990	43		43		14			
1991	46	8		38			8	
1992	75		25					
1993	44		22				33	
1994	7		2				5	
1995	44			11			33	11
1996	25			75				
1997	67		33					
1998	86		14					
1999	67						33	
2000	37	18		27			18	
2001	67		33					

WOLF MANAGEMENT REPORT

From: July 1, 1999

To: June 30, 2002

LOCATION

GAME MANAGEMENT UNIT: 6 (10,140 mi²)

GEOGRAPHIC DESCRIPTION: Prince William Sound and North Gulf Coast

BACKGROUND

Gray wolves are endemic to the mainland areas of Unit 6. During the early and mid-20th century, wolves occurred at low densities (Nelson, G.B. 1934). Heller (1910) reported tracks in Nelson Bay in eastern Unit 6D, and locals indicated that wolves were present east of Nelson Bay in Unit 6C. The only ungulate prey available during this period were mountain goats. However, salmon, beaver and waterfowl are also important prey for coastal wolves (Carnes et al. 1996). Railroad, oil and coal development projects on the Copper and Bering River Deltas during the early 1900s may have impacted wolf numbers as human access into these areas increased.

Additional ungulate prey became available in during the mid 1900s as a result of successful Sitka black-tailed deer and moose introductions (Burris and McKnight 1973). Deer were introduced during 1916–1923 to islands of Prince William Sound, which subsequently established populations on the mainland of eastern Unit 6D (Nelson, G.B. 1932). Moose calves were released on the Copper River Delta during 1949–1958 and the herd rapidly grew and expanded eastward toward Cape Yakataga. However, wolves were rare in Unit 6 through the 1950s, with few bounties paid on wolves during the years of predator control from the 1940s through 1960s (Robards FC. 1955, Reynolds 1973). Predator control on interior populations may have prevented wolves from colonizing Unit 6 prior to the 1970s.

Wolves began to increase and disperse during the 1970s in areas of Unit 6 where moose were established. By 1973, a pack of 15–20 wolves occupied Unit 6B, from which 6 were harvested (Reynolds 1973). Reynolds (1979) reported that mountain goats had declined by 50% between 1970 and 1978 in the mountains of Units 6B and western 6A, attributing the decline to predation by wolves. I suspect that lack of escape terrain, naïve goats, and a switch from compensatory to additive hunting pressure contributed to the goat decline. Wolf numbers apparently peaked in the late 1980s (Griese 1990), then declined and stabilized at a lower density during the 1990s (Carnes et al. 1996, Nowlin 1997). During the 1990s, three of five goat populations in Units 6B and western 6A recovered to pre-wolf levels. The other 2 populations are in marginal goat habitat with limited escape terrain.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

To maintain a wolf population in a minimum of 5 packs that will sustain an annual harvest of 10 wolves.

METHODS

I estimated population size and distribution of wolves before the trapping season using incidental observations by staff, trappers, hunters and guides. The U.S. Forest Service studied wolves in Units 6A, 6B and 6C during 1992–96 using radiotelemetry (Stephenson et al. 1993, Carnes et al. 1996). I assumed that pack distribution has remained similar to that described by Carnes et al. (1996).

We collected harvest data by sealing hides of wolves taken by trappers and hunters. We recorded location and date of harvest, method of take, transportation mode, sex, and pack size. I also used basic modeling (in spreadsheet form) to make a best guess at sizes for those packs not observed for several years but where harvest has occurred. My model assumptions were 1–2 pups recruited per year per pack (5 pups per litter with 30% survival) and 10–15% non-hunting mortality on adults. I adjusted pack models to fit opportunistic field observations taken during moose surveys or by experienced guides.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The wolf population was approximately 42–60 during 2001–02, composed of 10 packs and loners. Numbers were relatively stable over the past 5 years (Table 1).

Distribution

Unit 6A had approximately 21–31 wolves in 5 packs: Icy Bay (2–4 wolves), White River (3–4), Tsiu River (6–9), Suckling Hills (7–9), and Bering River (2–6). Unit 6B had 12–14 wolves in 2 packs: Martin River (5–6), and Russian River (7–8). Unit 6D had 10–14 wolves in 3 packs: Rude River (3–4), Lowe River (4–6), and Wortmanns Glacier (3–4). Pack size and distribution in Unit 6D remains speculative.

Unit 6C had only 1–3 wolves during the reporting period. For 8–10 years (circa 1987–1996) there were 2 packs present in 6C. Easy access by trappers and hunters from Cordova ultimately caused the decline and break-up of these packs (Carnes et al. 1996), leaving Unit 6C with brown bears as the only important predators. The average proportion of calves in the moose population during 1996–2001 was 18% in Unit 6C, compared to 12% in Units 6A and 6B, where both wolf and bear predation occur.

Wolves have not become established on major islands in Unit 6D. Deer would be adequate prey for wolves, as they are in Southeast Alaska. Wolves or wolf sign have been occasionally

reported on Hawkins and Hinchinbrook Islands, both are readily accessible from the Copper River Delta by crossing mudflats and swimming channels at low tide. Both islands have permanent and seasonal human residents who may conduct wolf control opportunistically. However, no legal kills have ever been reported from the islands.

MORTALITY

Harvest

Season and Bag Limit. The hunting season was from 10 August to 30 April, with a bag limit of 5 wolves. The trapping season was 10 November to 31 March, with no bag limit.

Board of Game Actions and Emergency Orders. The Board of Game took no actions and no emergency orders were issued during this reporting period.

Hunter/Trapper Harvest. Reported annual harvest during this reporting period was 2–13 wolves (25 total), composed of 33–50% females (Table 2). Six wolves were trapped, 17 shot, and a vehicle hit 1. Total estimated unreported and illegal harvest was 4–5. Harvest of 13 wolves during 2000–01 was the highest on record, although it included 1 road kill from Unit 6C. One wolf was killed in April 2000 after it attacked a 6 year-old boy at the Icy Bay logging camp (McNay 2002).

Hunter Residency and Success. The number of successful hunters and trappers was 2–9 (Table 2). Poor snow and trapping conditions during 2001–02 resulted in only 2 wolves being killed. Unit 6B, where most wolf harvest occurs, was inaccessible for most of that season.

Harvest Chronology. Wolves were taken throughout the season during the reporting period (Table 3).

Transport Methods. During this reporting period the primary methods of transportation were airplanes, snowmachines and highway vehicles (Table 4). Two wolves were taken by boat during 1999.

CONCLUSIONS AND RECOMMENDATIONS

The population objective was achieved. Number of packs exceeded the minimum of 5. The wolf population was lightly harvested and sustained the take of 10 animals specified in the objective. No management changes are recommended.

LITERATURE CITED

- BURRIS O. E., AND D. E. MCKNIGHT. 1973. Game transplants in Alaska. Technical Bulletin. Alaska Department of Fish and Game. Juneau, Alaska, USA.
- CARNES, J. C., V. VAN BALLEMBERGHE, AND J. M. PEEK. 1996. Ecology of wolves on the Copper and Bering River deltas, Alaska. Unpublished Report USDA, Forest Service. 52pp.

- GRIESE, H. J. 1990. Unit 6 wolf survey-inventory report. Pages 22–27 *in* S.O. Morgan, ed. Annual performance report of survey-inventory activities. Part XV. Wolf. Vol. XX. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Project W-23-2, Study 14.0. Juneau. 158pp.
- HELLER, E. 1910. Mammals of the 1908 Alexander Alaska expedition, with descriptions of the localities visited and notes on the flora of the Prince William Sound region. University of California Publication. 5(11):321–360.
- MCNAY, M. E. 2002. A case history of wolf-human encounters in Alaska and Canada. Alaska Department of Fish and Game. Wildlife Technical Bulletin 13. 45pp.
- NELSON, G. B. 1932. Annual report game, fur and game fish. Alaska Game Commission Cordova. (Memorandum).
- NELSON, G. B. 1934. Annual report game, fur and game fish. Alaska Game Commission Cordova. (Memorandum).
- NOWLIN, R. A. 1997. Unit 6 wolf survey-inventory report. Pages 30–34 *in* MV Hicks, ed. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Grants W-24-2, W-24-3, W-24-4. Study 14.0. Juneau, Alaska USA.
- REYNOLDS, J. R. 1973. Unit 6 wolf survey-inventory progress report. Pages 96–97 *in* Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Annual report of survey-inventory activities. Part IV. Project W-17-5, Study 14.0. Juneau. 171pp.
- REYNOLDS, J. R. 1979. Unit 6 mountain goat survey-inventory progress report. Pages 63–69 *in* Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Annual report of survey-inventory activities. Project W-17-11, Study 14.0. Juneau. 112pp.
- ROBARDS, F. C. 1955. Annual report game, fur and game fish. U.S. Fish and Wildlife Service Cordova. (Memorandum).
- STEPHENSON, T. R., V. VAN BALLEMBERGHE, AND J. M. PEEK. 1993. Ecology of wolves on the North Gulf coast of Alaska. Unpublished Report USDA, Forest Service. 14pp.

PREPARED BY:

David W. Crowley
Wildlife Biologist III

SUBMITTED BY:

Michael G. McDonald
Assistant Management Coordinator

Please cite any information taken from this section, and reference as:

Crowley, D. W. 2003. Unit 6 wolf management report. Pages 52–57 *in* C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 6 fall wolf population estimates^a, 1997–02

Regulatory Year	Population estimate	Number of packs	Basis of estimate
1997/98	44–60	9	b,c
1998/99	51–68	8	b,c
1999/00	55–71	9–11	b
2000/01	52–67	9–11	b
2001/02	44–62	9–11	b

^a Pre-trapping season.

^b Incidental observations, harvest locations, basic modeling

^c US Forest Service, Cordova Ranger District telemetry

Table 2 Unit 6 wolf harvest, 1997–02

Regulatory Year	Reported harvest				Estimated harvest		Method of take			Successful
	M	F	(%)	Total	Unreported	Illegal	Trap/snare	(%)	Shot	Total trap/hunt
1997/98	4	2	(33)	6	2	2	3	(60)	2	4
1998/99	2	4	(67)	6	2	2	1	(20)	4	5
1999/00	7 ^a	3	(33)	10	2	2	0	(0)	9	9
2000/01 ^b	7	4	(36)	13	1	1	5	(42)	7	7
2001/02	1	1	(50)	2	2	4	1	(50)	1	2

^a One road kill, 1 DLP from Icy Bay attack

^b Two of unknown sex, 1 unknown methods

Table 3 Unit 6 wolf harvest chronology percent, 1997–02

Regulatory Year	Harvest periods									<i>n</i>
	August	September	October	November	December	January	February	March	April	
1997/98	0	0	0	20	20	20	20	0	20	6
1998/99	0	33	33	0	0	0	0	33	0	6
1999/00	0	22	22	0	0	11	11	22	11	9
2000/01	0	8	0	23	15	0	23	23	8	13
2001/02	0	0	50	0	0	50	0	0	0	2

Table 4 Unit 6 wolf harvest percent by transport method, 1997–02

Regulatory Year	Percent of harvest						<i>n</i>
	Airplane	Dogsled skis Snowshoes	Boat	Snow- machine	ORV	Highway vehicle	
1997/98	20	20	0	60	0	0	5
1998/99	50	0	0	0	0	50	6
1999/00 ^a	0	0	22	11	22	33	9
2000/01	15	0	0	15	0	0	13
2001/02	50	0	0	0	50	0	2

^aOne unknown

WOLF MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2002

LOCATION

GAME MANAGEMENT UNITS: 7 and 15 (10,637 mi²)

GEOGRAPHIC DESCRIPTION: Kenai Peninsula

BACKGROUND

Following a half-century absence, wolves recolonized the Kenai Peninsula during the 1960s. The first recent documentation was in 1961 when Jack Didrickson (ADF&G) observed a single wolf between Skilak and Tustumena Lakes. Observations increased throughout the 1960s, with the first pack sighting (10 wolves) in 1968 by Dimitri Bader (ADF&G).

The high density of moose and severe winters from 1971 through 1975 made moose easily available prey. In less than 15 years, wolves repopulated most suitable habitat. Peterson and Woolington (1981) estimated wolves annually killed 9–15% of the moose calves and 5–7% of adult moose on the Kenai Peninsula.

Aerial track counts and observations by trappers conducted from 1975 to 2002 indicated the Kenai Peninsula wolf population increased rapidly during the early 1970s, then remained relatively stable at 200 animals. According to Peterson and Woolington (1981), annual mortality of radiocollared wolves in Unit 15A was 38%. Pups composed 37% of the early winter population, reflecting the stability of the population in the northern portion of the Kenai Peninsula from 1976 to 1981. Natural mortality rates were low, despite the 1970s growth rate of the wolf population. Mortality rates, however, may be increasing because of the dense population of wolves and declining prey.

Regulated wolf harvests on the Kenai Peninsula began with a permit hunt during the winter of 1973–74; 2 wolves were harvested. During the winter of 1974–75, 6 were harvested. Hunting and trapping were allowed the following season (1975–76), and the harvest increased to 19 with 12 wolves harvested by trappers and 7 by hunters. Although the 9-month season was liberal, the harvest of wolves increased slowly until 1978–79, when 55 wolves were taken. The harvest from 1978–79 to 1986–87 ranged from 42 to 64 wolves and averaged 51, suggesting 25% of the estimated population was removed annually from 1978 to 1987.

In 1987 the Kenai National Wildlife Refuge imposed a 4-day trap check for trappers using most refuge-managed lands and the season was reduced. These restrictions reduced the

harvest which, over the next 12 years, ranged from 9 to 49 wolves and averaged 24 animals, 12% of the estimated population.

Historically, most of the wolf harvest has been during trapping season, while most nonconsumptive uses were in summer and early fall. Almost all wolves have been taken for recreational purposes; the dollar value received for pelts has been a secondary benefit. Although some hunters have used aircraft to locate wolves, trappers and hunters operating from the road system have killed most wolves. In the spring of 1986, the Board of Game prohibited the use of aircraft to locate wolves for the purpose of landing and shooting them. The land-and-shoot method was responsible for only 6% of the annual harvests from 1973 to 1985, occurring in only 5 of the 12 years. The low harvest was attributable to poor tracking and landing conditions in heavily forested areas, and the refuge was closed to aircraft.

An infestation of biting lice (*Trichodectes canis*) was identified from 2 packs of wolves during 1982–83. Wolves from these packs in Unit 15A were brought in for sealing by local trappers, and department and refuge personnel initiated a control program to treat all infested wolves. Wolves were captured and treated, and a medication (Ivermectin) was injected into moose recently killed by wolves or placed in treated baits near kills. Both methods proved unsuccessful, and the incidence of infestation spread rapidly across the Kenai. Infested wolves are common; using acceptable means we have little chance to control the parasite.

Following exhaustive searches over the years, infested wolves were found only on the Kenai Peninsula until December 1998 when they were discovered in Units 14 and 16. Three packs, totaling approximately 28 animals, were identified with *T. canis*. Treatment efforts by the department and harvesting of wolves by local trappers from these packs dealt with most of the infested wolves.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- To maintain a postseason population of 25–35 wolves in Unit 15A, excluding the Indian and Quartz Creek/Mystery creek packs.
- To maintain the spring wolf population at a maximum ratio of 1 wolf:50 moose in Units 15B and 15C and Unit 7.

METHODS

Experienced pilots and observers conducted aerial surveys during November and December but only under suitable snow and tracking conditions. Local trappers provided additional information concerning wolf pack distribution and size for unsurveyed areas. We monitored harvest by sealing the pelts of harvested wolves.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Wolf surveys were not conducted over the entire Kenai Peninsula because of unfavorable snow conditions during early winter. Harvest data, observations by department staff, and reports from trappers indicated the number of wolves probably increased from previous years. However, lacking complete survey data, the estimated population for Units 7 and 15 remained at 200 wolves in 20 packs (Tables 1 and 2).

MORTALITY

Harvest

Season and Bag Limits. The hunting season in Units 7 and 15 was 10 August to 30 April. The bag limit was 5, except on the Kenai National Wildlife Refuge where the bag limit was 2 wolves.

The wolf trapping season in Units 7 and 15 was 10 November to 31 March, and there was no bag limit.

Board of Game Actions and Emergency Orders. There were no Board of Game actions during this reporting period.

Hunter/Trapper Harvest. Thirty-eight wolves were killed during the hunting and trapping seasons in 1999–00, 63 in 2000–01 and 37 during 2001–02 in Units 7 and 15 (Table 3). Females accounted for 42% (n=16), 54% (n=34) and 54% (n=20) of the harvest during these years respectively (Tables 4 and 5). The mean annual harvest (46) for these 3 years represented an annual harvest rate of 23% of the estimated population.

The combined harvest for 1999–00 to 2001–02 of 138 wolves, included 83 (60%) taken by trapping or snaring, 50 (36%) by ground shooting and 5 (4%) from unidentified methods (Tables 4 and 5).

Harvest Chronology. The combined monthly harvest chronology for 1999–00 to 2001–02 (Table 6) was August, 8 (6%); September, 15 (11%); October, 12 (9%); November, 18 (13%); December, 16 (12%); January, 19 (14%); February, 17 (12%); March, 26 (19%), and Other, 7 (5%).

CONCLUSIONS AND RECOMMENDATIONS

A mean annual harvest of 46 wolves during the past 3 years represents 23% of the early winter population estimate of 200 for Units 7 and 15. With this low rate of harvest, the wolf population will probably be controlled by prey abundance, increased dispersal, and natural mortality.

The department and the US Fish and Wildlife Service (FWS) signed an agreement in 1988 to manage wolves in Unit 15A using a harvest quota system. Terms of this agreement were based on continuing the current level of harvest opportunity while protecting the wolf population from overharvest. In addition to this agreement, the FWS implemented several new restrictions on trappers using the refuge. These restrictions included a mandatory trapper orientation course before obtaining a permit, closures to trapping (except mink and muskrat) within 1 mile of a road, trailhead or campground, prohibition of toothed traps, 4-day trap checks, a requirement that traps be tagged by the owner and no snowmachine access until certain snow conditions exist. Reduced trapper effort and opportunity can be attributed to these permit conditions on the refuge, a limited season on lynx harvest by the Board of Game, and the poor quality of lice-infested wolf pelts.

I recommend that we discontinue the quota system for Unit 15A. With low effort and harvest (average 8 from 1997–2002), it is not warranted or cost effective. The management strategy for Unit 15A essentially mandates we manage wolves pack by pack. I recommend we consider the entire wolf population on the Kenai Peninsula as one population, accepting the fact that some packs living close to developed areas will sustain heavy harvests in some years. The increased harvest in 2000–01 was probably the result of good trapping conditions (snow cover and weather patterns) and possibly an increase in wolf density. Wolf survival probably increased during the severe winters of 1997–98, 1998–99 and 2000–01 when large numbers of moose died from winter stress. Allowable harvest should not exceed 35% or a 3-year mean annual harvest of 70 wolves.

LITERATURE CITED

PETERSON, R. O., AND J. D. WOOLINGTON. 1981. Wolf and moose studies on the Kenai Peninsula, Alaska. Final Report submitted to U.S.F.W.S. Contract No. 14-16-0008-2104.

PREPARED BY:

Jeff Selinger
Wildlife Biologist

SUBMITTED BY:

Michael G. McDonald
Assistant Management Coordinator

Please cite any information taken from this section, and reference as:

Selinger, J. 2003. Units 7 & 15 wolf management report. Pages 58–65 in C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1. Unit 7 fall wolf population estimate^a, 1994–2002

Year	Population estimate	Number of packs	Basis of estimate
1994–95	45	6	b
1995–96	45	6	b
1996–97	45	6	b
1997–98	45	6	b
1998–99	45	6	b
1999–00	45	6	b
2000–01	45	6	b
2001–02	45	6	b

^a Fall estimate = pretrapping season population.

^b Estimates derive from incidental observations of staff, sealing records, and reports from public.

Table 2. Unit 15 fall wolf population estimates^a, 1994–2002

Year	Population estimate	Number of packs	Basis of estimate
1994–95	155	14	b
1995–96	155	14	b
1996–97	155	14	b
1997–98	155	14	b
1998–99	155	14	b
1999–00	155	14	b
2000–01	155	14	b
2001–02	155	14	b

^a Fall estimate = pretrapping season population.

^b Results of research and management studies in addition to incidental observations and trapper reports.

Table 3. Known wolf mortality in Units 7 and 15, 1994–2002

Year	Unit				Total
	7	15A	15B	15C	
1994–95	7	7	3	3	20
1995–96	17	6	10	9	42
1996–97	9	10	5	6	30
1997–98	7	7	2	8	24
1998–99	13	9	7	21	50
1999–00	15	7	3	13	38
2000–01	32	7	12	12	63
2001–02	7	12	4	14	37

Trapping season 10 November–28 February.

Table 4 Unit 7 wolf harvest, 1994–2002

Regulatory year	<u>Reported Harvest</u>			<u>Method of Take</u>			Successful Trappers/hunters
	M	F(%)	Unk	Trap/snare (%)	Shot	Unk	
1994–95	3	4(57)	0	3(43)	4	0	6
1995–96	11	5(31)	1	11(65)	6	0	12
1996–97	3	6(67)	0	5(63)	3	1	7
1997–98	6	1(17)	0	4(57)	3	0	6
1998–99	8	3(27)	1	7(58)	5	0	10
1999–00	10	5(33)	0	11(73)	4	0	7
2000–01	14	18(56)	0	22(69)	10	0	14
2001–02	2	5(71)	0	6(86)	1	0	5

Table 5 Unit 15 wolf harvest, 1994–2002

Regulatory year	<u>Reported Harvest</u>			<u>Method of Take</u>			Successful Trappers/hunters
	M	F(%)	Unk	Trap/snare (%)	Shot	Unk	
1994–95	5	7(67)	1	9(69)	4	0	9
1995–96	11	14(56)	0	12(48)	13	0	17
1996–97	12	9(43)	0	10(48)	10	1	17
1997–98	8	9(53)	0	7(41)	10	0	14
1998–99	17	17(50)	3	19(53)	17	1	27
1999–00	12	11(48)	0	10(48)	11	2	17
2000–01	15	16(52)	0	18(60)	12	1	18
2001–02	15	15(50)	0	16(57)	12	2	21

Table 6 Harvest chronology for wolves in Units 7 and 15, 1994–2002

Year	Month									Total
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Other	
1994–95	0	5	0	1	5	1	7	1	0	20
1995–96	4	2	1	4	12	8	4	7	0	42
1996–97	1	4	0	1	3	9	8	3	1	30
1997–98	0	3	4	0	5	4	3	0	5	24
1998–99	1	3	0	3	4	14	11	9	4	49
1999–00	2	4	6	6	3	4	1	12	0	38
2000–01	5	6	2	10	9	8	9	9	5	63
2001–02	1	5	4	2	4	7	7	5	2	37

WOLF MANAGEMENT REPORT

From: 1 July 1999

To: 30 June 2002

LOCATION

GAME MANAGEMENT UNITS: 9 (33,638 mi²) AND 10 (1586 mi²)

GEOGRAPHIC DESCRIPTION: Alaska Peninsula and Unimak Island

BACKGROUND

Wolves are found throughout the Alaska Peninsula (Unit 9) and on Unimak Island (Unit 10) in low-to-moderate densities. Specific data on historic wolf abundance are lacking, but the population was reduced by wolf control work during the 1950s. After the end of the federal wolf control program, wolves increased and thereafter were primarily affected by prey abundance and periodic outbreaks of rabies. Conditions favorable for land-and-shoot hunting and ground-based trapping have been rare over the past 25 years, so harvests have had relatively little influence on long term wolf numbers.

Prey abundance has varied during the past 50 years. Moose densities increased during the 1950s and 1960s and then decreased during the 1970s in all areas north of Port Moller. Moose numbers have been relatively stable during the past 20 years. The Mulchatna caribou herd increased from about 14,000 in 1974 to over 200,000 in 1996, and appear to have declined slightly since then. The Northern Alaska Peninsula Caribou Herd (NAPCH) increased from about 13,000 in the mid-1970s to about 20,000 in 1984. During the next 10 years, the NAPCH remained relatively stable at 15,000–18,000. During the past 8 years the herd has declined to about 6,300 in 2001. Caribou decreased dramatically on Unimak Island from a peak of 5000 in 1975 to only a few hundred by 1977. No change in caribou numbers on Unimak Island occurred during the next 20 years, but starting in the late 1990s the herd has grown to about 1,200 by 2001. The Southern Alaska Peninsula Caribou Herd (SAPCH) peaked at over 10,000 in 1983, and then declined to 2000 by 1995. This segment of the SAPCH has recovered to about 3900 by 2002.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

During the previous reporting period, the management objective was to maintain a wolf population that will sustain a 3-year-average annual harvest of at least 50 wolves. Given the limitations imposed by climate and budget, it was impractical to set a management goal based on a desired wolf density or total population when there is no feasible way to measure whether we were meeting the objective.

METHODS

Specific data were not collected on wolf densities in Units 9 or 10. We monitored trends through observations during other fieldwork, reports from hunters and guides, and responses to the annual trapper questionnaire. We monitored harvests from mandatory pelt-sealing reports.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

By piecing together observations of wolf packs and general knowledge of territory size, I estimate that Units 9 and 10 contain approximately 350 wolves. This is a conservative estimate, but it cannot be refined without considerable expense, combined with abnormally good snow and flying conditions.

Wolf numbers appear to have increased throughout Unit 9, despite the decline of the NAPCH since 1993. Although relatively few trapper questionnaires have been returned in recent years, trappers generally agree that wolf abundance has increased during this reporting period.

MORTALITY

Harvest

Season and Bag Limits. The hunting season in Units 9 and 10 was 10 August to 30 April, and the bag limit was 5 wolves. The trapping season in Units 9 and 10 was 10 November to 31 March with no bag limit.

Board of Game Actions and Emergency Orders. In March 2003 the Board changed the hunting bag limit to 10 per day with not seasonal limit.

Hunter/Trapper Harvest. The wolf harvest for 1999–00, 2000–01, and 2001–02 were 142, 30, and 106, respectively, in Units 9 and 10 (Table 1). Two wolves were sealed from Unit 10 in 2000 and 1 wolf was sealed in 2001.

Hunter Residency and Success. Furbearer harvest records from sealing certificates do not contain information on individual hunters or trappers, so no information on residency or success is available.

Harvest Chronology. Harvest chronology continues to peak December–March (Table 2).

Transport Method. Inaccurate reporting of the method of transportation used for harvesting wolves hampers analysis; however, most harvesters used aircraft or snowmobile (Table 3).

Other Mortality

One rabid wolf was confirmed in Port Heiden, and a number of rabid red foxes and 1 coyote were reported elsewhere in Unit 9E during 1998. No significant out breaks of rabies has occurred on the Alaska Peninsula since 1998.

HABITAT

Assessment

No significant alteration to habitats occurred in Units 9 and 10 during this report period.

CONCLUSIONS AND RECOMMENDATIONS

The wolf harvest in Unit 9 varies widely, depending on weather conditions and the activity of several individuals who use aircraft. Harvest has had little effect on the wolf populations in Units 9 and 10. For practical and budgetary reasons, it is unlikely that more accurate estimates of population size will be possible. Sealing data on sex composition of harvest and methods of take and transportation do not seem reliable; analyses using these data are not recommended. I recommend no regulatory changes.

PREPARED BY:

Richard A. Sellers
Wildlife Biologist III

SUBMITTED BY:

Michael G. McDonald
Assistant Management Coordinator

Please cite any information taken from this section, and reference as:

Sellers, R. A. 2003. Unit 9 & 10 wolf management report. Pages 66–69 *in* C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

TABLE 1 UNITS 9 AND 10 WOLF HARVEST, 1999–00 THROUGH 2001–02

Regulatory Year	Reported harvest				Method of take			Successful Trappers/Hunters
	M	F	Unk	Total	Trap/Snare	Shot	Unk	
1997–98	36	30	6	72	51	21	0	43
1998–99	57	32	2	91	60	25	6	41
1999–00	74	61	7	142	31	111	0	57
2000–01	17	13	0	30	7	21	2	23
2001–02	59	44	3	106	28	78	0	44

Table 2 Units 9 and 10 wolf harvest chronology percent, 1999–00 through 2001–02

Regulatory Year	August	September	October	November	December	January	February	March	April	<i>n</i>
1997–98	0	10	11	7	15	24	28	3	3	72
1998–99	1	1	1	0	3	24	24	34	3	91
1999–00	0	7	5	1	9	41	19	15	1	138
2000–01	0	20	13	3	17	30	17	0	0	30
2001–02	0	11	7	5	12	18	37	9	1	106

Table 3 Units 9 and 10 wolf harvest percent by transport method, 1999–00 through 2001–02

Regulatory Year	Dogsled			3- or 4- Wheeler	Snowmachine	ORV	Highway Vehicle	Unknown	<i>n</i>
	Airplane	Skis Snowshoe	Boat						
1997–98	32	0	0	21	39	3	5	0	72
1998–99	3	0	0	7	78	0	4	8	91
1999–00	12	0	1	1	85	0	0	1	142
2000–01	20	0	3	17	33	0	7	10	30
2001–02	15	0	0	15	63	0	1	5	106

WOLF MANAGEMENT REPORT

From: 1 July 1999

To: 30 June 2002

LOCATION

GAME MANAGEMENT UNIT: 11 (13,257 mi²)

GEOGRAPHIC DESCRIPTION: Wrangell Mountains

BACKGROUND

Wolf population estimates and trends are unavailable for Unit 11 before the 1950s. Skoog (1968) assessed that wolf numbers were low from 1900 to the 1930s, then increased, according to written accounts by settlers. In 1948 the U.S. Fish and Wildlife Service initiated an extensive wolf control program that lasted until 1953. Following termination of the control program, wolf numbers increased and probably peaked during the mid 1960s. In the early 1970s, wolves were still abundant (McIlroy 1974) with 1 wolf/80 mi² (4.8 wolves/1000km²), and a unit population of 100–125 animals. Unitwide population estimates were initiated in 1985. In the late 1980s wolf numbers were high, averaging an estimated 106 wolves in the spring. During the period between 1991 and 2001, wolf numbers were stable but lower with an average spring estimate of 81 wolves.

Although the size of wolf harvests before mandatory sealing is unknown, harvests were probably similar to harvests reported during the early 1970s due to comparable trapping seasons and no bag limits. Wolf harvests since 1972 have averaged 26 wolves per year, ranging widely from 6 to 51 wolves per year.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- To maintain a minimum posthunting and trapping season population of 75 wolves.
- The human-use objective is to allow limited human harvests when they do not conflict with management goals for the unit or objectives for the population.

METHODS

We monitor the annual wolf harvest by sealing the hides of all wolves harvested in the unit. We collected information on wolf numbers and distribution from interviews with hunters and trappers when pelts were sealed and from incidental observations while conducting surveys

for other species. No aerial track surveys were conducted in Unit 11 during this reporting period.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Wolf numbers are currently higher than the 10-year (1991–2000) mean population estimate of 80 wolves in Unit 11. The spring population estimate for Unit 11 increased by 23%, going from 80 to 90 (15 packs) in 2001 to 100–110 (14 packs) in 2002 (Table 1).

Distribution and Movements

Wolf numbers were higher in the northern portions of the unit, especially from the Dadina River northeast to the Copper River. Caribou were available to wolves at least part of the year in this area, and moose were more abundant than in the southern portions of the unit. Telemetry data during the winter of 1996–97 showed some wolves also use the higher elevations, suggesting they also target sheep as prey. Wolf numbers in the lower Chitina river valley remain lower than in the northern portion of the unit because caribou are absent and moose less abundant. Wolves heavily utilized sheep and mountain goats in the lower Chitina Valley, but because of their smaller body size and the difficult terrain, these prey did not support as large a wolf population.

MORTALITY

Harvest

Season and Bag Limit. The hunting season in Unit 11 was from 10 August to 30 April and the bag limit was 5 wolves. Trapping season was from 10 November to 31 March and there was no bag limit.

Board of Game Actions and Emergency Orders. In 1993 the Board of Game passed a regulation allowing trappers to shoot wolves same-day-airborne if the trapper was 300 feet away from the aircraft before shooting. Methods and means for taking wolves in Unit 11 remained unchanged until Proposition 3 passed during the November 1996 general election. This referendum prohibited taking of wolves the same-day-airborne unless the wolf was in a trap or snare, effective 25 February 1997.

Hunter/Trapper Harvest. Hunters and trappers harvested 23 wolves from Unit 11 during the 2001–02 season (Table 2). Harvests during this reporting period fluctuated between years but the 5-year average take of 28 wolves was similar to the 26 wolf average harvest since 1972, when sealing of wolves became a requirement. Males composed 48% of the take during this reporting period, down slightly from 54% of the reported harvest during 1992–96. Hunters and trappers reported taking most of the wolves from either the Nabesna Road or along the Copper River. This harvest pattern was similar to past years when harvests were near areas with easy access.

The harvest methods for wolves killed in Unit 11 over the past 5 years are provided in Table 2. Over the period 1997–2002, trapping and snaring accounted for 93% of the harvest for which the method of take was known. Prior to 1987, when land-and-shoot was legal, this harvest method was popular and accounted for 25% of the wolf harvest between 1980 and 1987. Unreported and illegal harvests were minimal during the reporting period.

Hunter/Trapper Residency and Success. During the 2000–01 season, 8 individuals sealed an average of 2.9 wolves from Unit 11. During the preceeding 5 seasons, the average harvest was 3.1 wolves per individual. Most individuals sealing wolves from Unit 11 live in the unit or in rural communities adjacent to the unit.

Harvest Chronology. Table 3 presents the harvest chronology for wolves over the past 5 years. The proportion of the harvest by month has varied yearly, but January and February had the highest harvest. The annual harvest chronology for trapped wolves probably reflected conditions for snowmachine travel (snow depth, river ice, and weather conditions), rather than any pattern of trapper effort or success. The number of wolves taken during the fall months, presumably by big game hunters, has ranged from 1 to 4 since 1985 and includes most of the nonresident take for trophies.

Transport Methods. The method of transport used in harvesting wolves has only been recorded on sealing certificates since 1985. In Unit 11 most wolves have been taken with the use of snowmachines (Table 4). The use of aircraft has declined since land-and-shoot became illegal. Trappers who use aircraft to fly out and make sets have taken very few wolves, although aircraft can be used effectively to find wolf kills, and a trapper can land and set snares for returning wolves at the kill site. Most aircraft use was by hunters who took a wolf incidentally while on fly-in hunting trips for other big game.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Wolf estimates are difficult to assess in Unit 11. All wolf estimates for the unit are based on pack or track sightings by department staff, hunters, trappers, and the public. Track surveys have been done only periodically and in different locations since 1978. The lack of a systematic survey method hampers efforts to estimate wolf numbers. Even establishing a yearly trend area will not assure yearly population estimates. The occurrence of high winds in Unit 11 often obscures tracks or blows snow to the extent that surveys are not feasible. The use of radiocollared wolves would provide more accurate information on wolf numbers in this unit.

CONCLUSIONS AND RECOMMENDATIONS

The number of wolves estimated to inhabit Unit 11 increased slightly the last two years of this report period. Between 1991 and 2000, wolf population estimates for Unit 11 were relatively stable with some yearly fluctuations as a direct result of survey effort and snow conditions that affect survey results. However, wolf estimates in Unit 11 are considered a minimum because of the limited data available for many large areas in the unit.

Harvests have varied between 23 and 36 wolves over the last 5 years in Unit 11. The wolf harvest rate for this period was 26% of the estimated fall population. Because the number of trappers taking wolves in Unit 11 is low, individual effort and weather conditions affect the harvest more than changes in wolf abundance. Most wolf harvest in Unit 11 is concentrated near access points and inhabited areas where trappers live. High harvest rates concentrated in these areas could result in localized population declines. In vast portions of the unit, however, wolves are not hunted or trapped. The reasons are that aircraft use is illegal, much of the unit is without roads, and physical barriers such as large rivers and mountains limit snowmachine and ORV travel. Current low harvest levels are not thought to limit the wolf population. The availability of prey is considered the limiting factor in wolf abundance in Unit 11.

LITERATURE CITED

- McILROY, C. 1975. Unit 11 wolf survey–inventory progress report. Pages 106–109 in D. E. McKnight, ed. Annual report of survey-inventory activities. Part III. Caribou, Marine Mammals, Mountain Goat, Wolf, and Black Bear. Vol. V. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Progress Report, Project W-17-6. Jobs 3, 8, 12, 14, 17 and 22. Juneau, Alaska USA. 198pp.
- SKOOG, R. O. 1968. Ecology of the caribou (*Rangifer tarandus granti*) in Alaska. Ph.D. Thesis. Univ. California, Berkeley. 699pp.

PREPARED BY:

Robert W. Tobey
Wildlife Biologist

SUBMITTED BY:

Michael G. McDonald
Assistant Management Coordinator

Please cite any information taken from this section, and reference as:

Tobey, R.W. 2003. Unit 11 wolf management report. Pages 70–75 in C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1. Unit 11 fall and spring wolf population estimates^a, 1997–2002.

Year	Population estimate		Packs	Basis of estimate
	Fall	Spring		
1997–1998	85–105	70–85	10	b, c
1998–1999	100–125	70–85	10	b, c
1999–2000	100–115	60–75	15	b, c
2000–2001	100–110	80–90	15	b, c
2001–2002	100–115	100–110	14	b, c

^a Fall estimate = pretrapping season population.

^b Fall estimates based on known spring pack sizes, mean birth rate of 5–6.5 pups/pack, a pup survival rate of 0.82 and fall sightings.

^c Basis of spring estimate is from limited track surveys, incidental observations, reports from public, and sealing records.

Table 2. Unit 11 wolf harvest, 1997–2002.

Regulatory Year	Reported harvest							Estimated Harvest		Method of Take						Successful trappers/Hunters
	M	%	F	%	Unk	%	Total	Unreported	Illegal	Trap/snare	%	Shot	%	Unk	%	
1997–1998	11	(44)	12	(48)	2	(8)	25	2	3	24	(96)	1	(4)	0	0	11
1998–1999	16	(44)	16	(44)	4	(11)	36	2	3	35	(97)	1	(3)	0	0	9
1999–2000	16	(70)	7	(30)	0	(0)	23	2	3	21	(91)	2	(9)	0	0	11
2000–2001	18	(51)	17	(49)	0	(0)	35	2	3	31	(89)	4	(11)	0	0	14
2001–2002	6	(26)	17	(74)	0	(0)	23	2	3	21	(91)	2	(9)	0	0	8

^a In 1997,

Table 3. Unit 11 wolf harvest percent chronology by month, 1997–2002.

Regulatory Year	Harvest periods									<i>n</i>
	August	September	October	November	December	January	February	March	April	
1997–1998	0	0	0	20	8	28	36	8	0	25
1998–1999	0	3	0	8	8	53	17	11	0	36
1999–2000	0	9	0	0	22	30	13	26	0	23
2000–2001	9	3	0	11	17	49	11	0	0	35
2001–2002	4	0	0	0	4	9	43	39	0	23

Table 4. Unit 11 wolf harvest percent by transport method, 1997–2002

Regulatory year	Percent of Harvest								<i>n</i>
	Airplane	Dog sled skis/ Snowshoes	Boat	4-wheeler	Snowmachine	ORV	Highway Vehicle	Unknown	
1997–1998	4	4	0	0	88	0	3	0	25
1998–1999	3	6	0	0	88	0	3	0	36
1999–2000	0	0	0	9	91	0	0	0	23
2000–2001	23	6	0	0	69	0	3	0	35
2001–2002	17	9	0	4	70	0	0	0	23

WOLF MANAGEMENT REPORT

From: July 1, 1999

To: June 30, 2002

LOCATION

GAME MANAGEMENT UNIT: 13 (22,857 mi²)

GEOGRAPHIC DESCRIPTION: Nelchina and Upper Susitna Rivers

BACKGROUND

Wolf numbers in Unit 13 were low from about 1900 until the early 1930s, reflecting corresponding low prey densities (Skoog 1968). Wolf numbers increased after this period, and by the mid 1940s wolves were considered common (Ballard et al. 1987). As a result of predator control by the U.S. Fish and Wildlife Service (FWS) between 1948 and 1953, wolf numbers declined dramatically. Based on estimates in Rausch (1967), as few as 12 wolves may have remained in the unit in 1954. Following cessation of wolf control, wolf numbers increased rapidly. A population of 350 to 450 wolves was estimated in 1965, and fall population estimates in subsequent years exceeded 300 wolves through the 1970s (Ballard et al. 1987). During the early-to-mid 1980s, wolf estimates were lower, averaging 275 wolves during the fall, then increased to a 370 wolf average during the mid 1990s. By the late 1990s, the Unit 13 wolf population increased to record high numbers.

Before statehood (i.e., 1959) wolves were harvested under FWS regulations that provided year-round seasons and no bag limits. Denning and aerial shooting were legal, and bounties were paid. Beginning with statehood in 1959, the wolf season was closed in Unit 13 for a 5-year period. In 1965, a short season was held. During the late 1960s, seasons were established that approximated current dates with no bag limits. In 1971 mandatory sealing was established and aerial shooting without a permit was prohibited (Harbo and Dean 1983). Harvest levels prior to mandatory sealing are unknown. Between 1971 and 1991, an average of 91 (range = 32–145) wolves per year were sealed in Unit 13. Harvests increased through the mid-to-late 1990s, averaging 155 (range = 95–220) wolves per year.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Determine wolf population estimates yearly. Regulate wolf harvests yearly to prevent overharvesting yet maintain adequate harvests to assure that management objectives for wolves in Unit 13 are met.

MANAGEMENT OBJECTIVES

To achieve and maintain a posthunting and trapping season population of 135 to 165 wolves (3–4 wolves/1000 km²) distributed proportionally among subunits.

METHODS

We conducted aerial track surveys to estimate the wolf population in Unit 13 during late fall and again in late winter. Biologists flew surveys in a systematic manner in an attempt to locate wolf tracks, then followed tracks to determine the size and color composition of the pack. Additional information on wolf numbers and distribution was collected by trapper surveys and incidental sightings by department personnel and the public. This information was combined with survey data to extrapolate a unit population estimate. We monitored harvest by requiring sealing of all wolves taken in the unit.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The spring 2002 wolf population estimate was 230 (5.4 wolves/1000 km²) wolves (Table 1), down 23% from the spring 1999 population estimate of 300 wolves (7.0 wolves/1000 km²). This 1999 estimate was the highest spring population estimate reported in Unit 13 in over 25 years. Fall population estimates approached 500 (12.0 wolves/1000 km²) wolves (Table 1) between 1998 and 2001 and are the highest ever reported in Unit 13. Historically, other portions of Alaska have supported wolf densities as high as 20 wolves/1000 km² (Ballard et al. 1987). The fall 2002 estimate of approximately 390 (9.1 wolves/1000 km²) wolves was a calculated estimate based on reduced productivity estimates. Weather conditions and a lack of snow during 2002–03 prevented unitwide wolf surveys.

Population Composition

Sex composition data for wolves in Unit 13 are not available. Age composition data are inferred by comparing fall population estimates to the previous spring. The fact that fall estimates are appreciably higher than spring estimates indicate pup production and survival has been good in Unit 13. Pup production and survival in the late 1990s was especially high, possibly because of a snowshoe hare cycle high. Hares provide an additional source of food during the critical whelping period and allow for higher pup survival. Pup production and/or survival was thought to be lower starting in 2001 because of the crash in hares and rather appreciable declines of moose and caribou in recent years.

Distribution and Movements

Distribution and movement patterns of wolves in Unit 13 are dependent on prey availability (Ballard et al. 1987). In Unit 13, wolf territory, size and productivity are primarily functions of moose densities. Locations of radiocollared wolves indicate wolves usually do not follow caribou that are migrating out of the wolf pack's territory. As in other areas in Alaska, a certain percentage of Unit 13 wolves are observed as singles and may be dispersing.

Immigration into Unit 13 is relatively common as radiocollared wolves from the Kenai Peninsula, Denali National Park, and Units 20 and 12 have been observed or harvested in Unit 13.

MORTALITY

Harvest

Season and Bag Limit. Wolves are harvested under hunting and trapping regulations. Wolf trapping season runs from 15 October until 30 April. However, steel traps or snares smaller than 3/32-inch diameter may be used only between 10 November and 31 March. Wolf hunting season runs from 10 August to 30 April with a bag limit of 10 wolves per day. Between March and December 2000, land and shoot taking of wolves was legal in the wolf control implementation area of 13A, B, and E if the hunter was 300 feet from the aircraft.

Board of Game Actions and Emergency Orders. The board designated Unit 13 an intensive management area in 1995. Increased human harvest of moose and caribou became the primary objective for the unit. As a result, the Board reduced the wolf population management objective to between 135 and 165 wolves postharvest in the spring. Methods and means for wolf hunting and trapping remained unchanged until a statewide vote in the November 1996 general election passed Proposition 3. This proposition eliminated the taking of wolves the same-day-airborne as of 25 February 1997. During the March 1999 Board of Game meeting, the bag limit for wolf hunters in Unit 13 was increased to 10 wolves per day. The Board of Game, in March 2000, passed a wolf predation control implementation plan for Units 13A, B, and E east of the Alaska railroad except for federal lands. The management objective for a post control wolf population was 25 wolves in both 13A and B and 50 wolves in 13E. At this meeting, the Board also liberalized use of snowmachines for taking wolves. In spring 2000, the legislature passed a measure (SB267) allowing land and shoot taking of wolves in a wolf control implement area but in November 2000 another voter referendum again passed that prohibited land and shoot taking of wolves.

Hunter/Trapper Harvest. Hunters and trappers harvested 223 wolves in Unit 13 during the 2001–02 season (Table 2). The 2000–01 harvest of 269 was the highest ever reported in Unit 13. During this 5 year reporting period, 1,039 wolves were taken for a yearly average harvest of 208. A definite increase in the Unit 13 wolf harvest is evident when this 5-year average take is compared to the yearly average harvest of 81 wolves during the 10 years from 1980 to 1989. Harvest composition data suggest an overall even distribution of males and females in the harvest, but this is variable yearly (Table 2).

Snaring and trapping are the most successful methods of taking wolves since land-and-shoot permit hunts ended; snaring and trapping accounted for 55–84% of the harvest during this 5-year reporting period (Table 2). Ground shooting of wolves increased during the last 3 years of this reporting period, going from 15% of the take in 1997–98 to 37% in 2001–02. Only 14 wolves were taken during the short period in 2000 when land and shoot was again legalized.

Permit Hunts. The last wolf permit hunt in Unit 13 was a land-and-shoot registration hunt held between 1991 and 1993.

Hunter/Trapper Residency and Success. During the 2001–02 season, 70 hunters and trappers harvested an average of 3.2 wolves in Unit 13; the average take per trapper during the previous 4 years (1997–01) was 3.0 wolves per year. The average take per trapper has increased slightly from the 2.1 wolf average observed during the 1980s. In 2001–02, four nonresidents took 4 wolves, 25 local residents killed 84 wolves, and 41 nonlocal Alaska residents took 135 wolves.

Harvest Chronology. Harvest chronology varied somewhat during the last 5 years (Table 3). During this reporting period, February had the highest reported wolf harvest but there was little difference between all the mid-winter months. The change in harvest chronology between years probably reflects yearly changes in snowfall and temperature, which influences access and trapping conditions.

Transport Methods. When same-day-airborne hunting was legal (before 1992–93), successful hunters and trappers preferred using aircraft. Historically, more wolves were taken with the use of aircraft, reflecting the remote nature of the unit and the importance of same-day-airborne harvesting. In recent years use of snowmachines has surpassed using aircraft as the most important method of transportation (Table 4). This change occurred not only because it became illegal to take wolves same-day-airborne but because of improvements in snowmachines themselves. A few years ago significant improvements occurred in snowmachine design and manufacturing. Modern snowmachines are more powerful, faster, travel better in deep snow, are more comfortable to ride and much more mechanically reliable. As a result, trappers and hunters are able to penetrate further into remote portions of the unit. Aircraft use did increase in 2000 but this increase was attributed to the short-lived same day airborne regulation that allowed aircraft use for only a few weeks in the early winter.

Other Mortality

Ballard et al. (1987) determined natural mortality rates for radiocollared wolves in a portion of Unit 13. They attributed 11% of annual mortality to intraspecific strife and 9% to accidents, injuries, starvation, and drowning. Ballard attributed the remaining 80% to legal and illegal human harvest. Since completion of this study, taking of wolves by land-and-shoot has become illegal. By observing kill sites, we can determine illegal use of airplanes to take wolves. Field observations in recent years indicate the illegal wolf harvest in Unit 13 is minimal and does not affect population levels.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

The possible introduction of the biting dog louse into the Unit 13 wolf population could become a serious problem. A female yearling was trapped along the Copper River during January 2000 that had been tagged in 1999 while being treated for lice in Unit 14. Although this wolf demonstrated clinical evidence of louse infection, individual lice were not observed. The outlook for preventing the spread of lice into Unit 13 is poor because of the high infection rate of wolves in Units 14 and 15 coupled with the observed dispersal of wolves from these units into Unit 13. Also, domestic dogs in Unit 13 have periodically been diagnosed as having lice, thus providing another possible source of infection.

CONCLUSIONS AND RECOMMENDATIONS

Wolf numbers in Unit 13 decreased during this reporting period. The spring population estimate went from 300 wolves in 1999, the highest Unit 13 spring wolf estimate in over 25 years, to 230 in 2002. The reason for much of this decline was the increase in human harvests of wolves during this reporting period. These harvests were among the highest ever reported in Unit 13, and in some heavily trapped and hunted areas, exceeded 35% of the population. The percent harvest may be somewhat overestimated due to conservative wolf population estimates. Harvests in excess of 35% should result in an overall population decline. Even though record harvests were recently reported, the Unit 13 wolf population remains far above management objectives set by the Board of Game for wolves in Unit 13 in 1995.

The fall 2002 wolf estimate was the lowest in 4 years, though it also had the lowest confidence given that it was a calculated estimate. A lack of snowfall in 2002–03 made surveys extremely difficult. Sightings of a number of smaller packs lead to the speculation that a decline in productivity and/or pup survival may have occurred. Because of this, productivity and survival estimates were lowered when calculating the fall 2002 wolf population estimate. A decline in productivity and/or survival could be entirely possible because of a reduction of the Unit 13 prey base recently. Moose numbers in Unit 13 have declined as much as 40% in some areas. The Nelchina caribou herd is also down by 30% from 1995, and herd movements the last three years have been more restrictive and included fewer pack territories. Also the snowshoe hare cycle went from a 30-year high in the late 1990s to almost no hares the last two years. During the high, wolves were frequently observed taking hares and they were considered an important food source for pups in the den and allowed increased litter survival rates. This suspected slow decline in productivity or pup survival is typical of situations where wolves remain high enough to drive prey populations very low before wolf numbers are regulated (Gasaway et al. 1983). Because wolf populations show little self-regulation until prey become very low, wolf harvests must be increased to take a higher percentage of the wolf population in order to bring wolves within management objectives. Modeling of predator prey populations in Unit 13 suggest wolf numbers must be heavily reduced so the spring population approaches the minimum population objective of 135 wolves, or declines in moose numbers will continue.

Management options to reduce wolf numbers in Unit 13 are limited. Land-and-shoot wolf hunting effectively and economically allowed high wolf harvests that were distributed throughout the unit, even in remote areas. After land-and-shoot became illegal, human harvests by traditional hunting and trapping methods and means could not take a high enough portion of the wolf population to offset the high productivity rate observed in the Unit 13 wolfs, thus wolf numbers increased throughout the unit.

Economic factors play an important role in limiting wolf harvests by traditional ground trapping methods employed by the general public. Costs of snowmachines, gas, traps and other equipment have increased tremendously over the last 20–25 years, yet the price paid for wolf pelts has declined. Currently there is a good demand for only the best quality adult wolves. Pups and average adults are much less marketable. Unless the fur market improves, economic incentives to wolf trappers would be needed to increase trapping effort and wolf

harvests over current levels observed in Unit 13. Also, the average age of trappers is rising as the economic incentives are not high enough for young people to enter the trapping profession. Three or four professional trappers in Unit 13 account for a large portion of the catch, and there does not appear to be any young people to replace them when they quit. Because of this, relying on trapping as traditionally practiced to limit wolf populations in Unit 13 may not be an effective management tool in the future.

LITERATURE CITED

- BALLARD, W. B., J. S. WHITMAN, AND C. L. GARDNER. 1987. Ecology of an exploited wolf population in southcentral Alaska. Wildlife Monograph 98. 54pp.
- GASAWAY, W. C., R. O. STEPHENSON, J. L. DAVIS, P.E.K. SHEPHERD, AND O. E. BURRIS. 1983. Interrelationships of wolves, prey and man in interior Alaska. Wildlife Monograph 84. 50pp.
- HARBO, S. J. JR., AND F. C. DEAN. 1983. Historical and current perspectives on wolf management in Alaska. Pages 52–64 in L. N. Carbyn, ed. Wolves in Canada and Alaska: their status, biology, and management. Proceedings of the Wolf Symposium, Edmonton, Alberta. Canadian Wildlife Service. Report. Series No. 45.
- RAUSCH, R. A. 1967. Some aspects of the population ecology of wolves in Alaska. *American Zoologist* 7:253–265.
- SKOOG, R. O. 1968. Ecology of the Caribou (*Rangifer tarandus granti*) in Alaska. Ph.D. Thesis. Univ. California, Berkeley. 699pp.

PREPARED BY:

Robert W. Tobey
Wildlife Biologist

SUBMITTED BY:

Michael G. McDonald
Assistant Management Coordinator

Please cite any information taken from this section, and reference as:

Tobey, R. W. 2003. Unit 13 wolf management report. Pages 91–98 in C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 13 fall and spring wolf population estimates^a, 1997–2002

Regulatory Year	Population estimate			Packs (nr)	Basis of estimate
	Fall	Spring			
1997–98	360–400	260	(240–280)	50	b
1998–99	475–525	300	(280–320)	55	b
1999–2000	490–540	270	(250–290)	60	b
2000–01	490–540	228	(200–240)	62	b
2001–02	460–500	230	(210–250)	67	b
2002–03	370–420	---	---	54	b

^a Fall estimate = pretrapping season population; spring estimate = posttrapping season population.

^b Basis of estimate, aerial track surveys, incidental observations, reports from public, sealing records.

Table 2 Unit 13 wolf harvest, 1997–2002

Reg Year	Reported harvest							Estimated Harvest		Method of Take										Successfu l trappers/ Hunters
										Trap										
	M	%	F	%	Unk	%	Total	Unreported	Illegal	snare	%	Shot	%	L&S	%	Unk	%			
1997/98	73	(49)	76	(50)	2	(1)	151	5	5	126	(83)	22	(15)	0	(0)	3	(2)	50		
1998/99	84	(48)	86	(49)	6	(3)	176	5	5	142	(81)	34	(19)	0	(0)	0	(0)	58		
1999/00	115	(52)	101	(46)	4	(2)	220	5	5	121	(55)	97	(44)	0	(0)	2	(1)	88		
2000/01	129	(48)	134	(50)	6	(2)	269	5	5	166	(62)	79	(29)	14	(5)	10	(4)	80		
2001/02	116	(52)	105	(47)	2	(1)	223	5	5	140	(63)	83	(37)	0	(0)	0	(0)	70		

Table 3 Unit 13 wolf harvest chronology percent, 1997–02

Regulatory Year	Harvest periods									<i>n</i>
	August	September	October	November	December	January	February	March	April	
1997–98	3	2	3	17	14	14	31	14	3	151
1998–99	1	5	2	8	17	17	24	22	5	176
1999–00	2	6	0	6	20	16	27	17	6	220
2000–01	1	4	1	5	16	24	23	18	7	269
2001–02	0	5	0	10	16	21	21	20	7	223

Table 4 Unit 13 wolf harvest percent by transport method, 1997–02

Regulatory Year	Percent of Harvest								<i>n</i>
	Airplane	Dog sled skis/ Snowshoes	Boat	4-wheeler	Snowmachine	ORV	Highway vehicle	Unknown	
1997–98	6	1	0	1	79	1	12	0	151
1998–99	22	1	1	0	62	8	4	2	176
1999–00	4	3	0	4	80	1	6	1	220
2000–01	25	4	1	2	60	0	4	4	269
2001–02	7	0	0	1	79	0	8	5	223

WOLF MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2002

LOCATION

GAME MANAGEMENT UNIT: 14 (6,624 mi²)

GEOGRAPHIC DESCRIPTION: Eastern Upper Cook Inlet

BACKGROUND

Wolf numbers in Unit 14 were probably low to moderate in the 1950s and early 1960s, primarily due to predator control efforts by the federal government (Rausch 1967). Wolf populations probably increased during the late 1960s and early 1970s after cessation of predator control activities and bounty payments. Wolf numbers remained low in the Matanuska Susitna Valley near human settlements through the 1970s. Additional increases in human population in this area and associated increases in hunting and trapping pressure further reduced wolf numbers until the mid-to-late 1980s. During the early 1990s wolf populations increased, in part because of high prey densities. Excessive winter moose mortality caused by deep snows during the winters of 1989–90 and 1994–95 contributed to the increases. High wolf densities also occurred in adjacent units because of reduced wolf hunting and trapping pressure. Wolf numbers remained high or even slightly increased through 2002; hunters, pilots and winter recreationists frequently observed wolves or tracks from wolf packs. Coincident with high wolf densities, reported harvest has also increased.

During November and December 1998 trappers caught several wolves (and coyotes) in Unit 14B that were infested with the dog-biting louse *Trichodectes canis*. This was the first time lice had been confirmed in Alaskan wolves outside the Kenai Peninsula, where louse-infested wolves were first seen in 1981. The source of the Unit 14 infestation was unknown, but we suspect interactions between feral dogs or wolf-hybrids and wild wolves was the cause. During January 1999 we mounted an effort to evaluate the extent of infestation and we treated infested wolves in the Susitna Valley to prevent the spread of lice to other areas of the state. Our efforts revealed 2 packs in Unit 14B were infested, as well as 1 pack in adjacent Unit 16A. We attempted to capture and treat all members of infested packs with the antiparasitic drug ivermectin (Merck & Co, Inc.). We also distributed approximately 1,200 medicated baits, aimed at coyotes, dogs and lone wolves. However, several louse-infested wolves were caught the following winter indicating we were unsuccessful in eliminating lice from area wolves.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

In Units 14A and 14B the primary goal is to provide for optimum harvest of wolves. In Unit 14C the primary goal is to provide opportunity to view, photograph and enjoy wolves. The secondary goal for all of Unit 14 is to provide maximum opportunity to participate in hunting and trapping wolves.

MANAGEMENT OBJECTIVES

The population objective is to maintain a minimum unitwide population of 55 wolves, with 35 wolves in Units 14A and 14B (combined), and 20 wolves in Unit 14C. The human-use objective in Units 14A and 14B is to allow harvest by hunting and trapping, provided harvest does not conflict with maintaining the population objective. The human-use objective in Unit 14C is to provide for nonconsumptive uses such as viewing, photography, listening, and the knowledge that wolves are present.

METHODS

Most reports of wolf distribution and pack size come from incidental observations by staff and the public, from sealing certificates, and interviews with wolf hunters and trappers. We collected harvest data when wolf hides were presented for sealing. All trappers who sealed fur in Unit 14 were queried about trends in wolf abundance through our trapper questionnaire.

We continued to monitor the spread of lice in the Susitna Valley through close inspection of all hides sealed. During moose surveys any wolves spotted were observed for any indication of infestation (excessive scratching by members or visible patterns of hair loss). Radiocollared wolves were tracked periodically to visually assess pelt characteristics and whether all pack members had been treated. No efforts were made to treat domestic pets in the affected area. The louse control effort is outlined completely in Golden et al. (1999).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

With information gathered during the lice control project, coupled with sealing information and observations from trappers and the public, we estimated Unit 14 contained 120–150 wolves during fall 1998 (Table 1). While this appears to be a large increase within a 5-year period, we believe wolf numbers had steadily increased in recent years and wolf numbers were under-estimated in prior years. The effort to control the spread of lice allowed us to get reliable minimum estimates of pack sizes and distribution in most of Unit 14B and the western portion of Unit 14A, the resulting numbers were substantially higher than previous estimates in those areas. This demonstrates that the "traditional" method of estimating wolf populations solely from incidental observations by staff, trappers, pilots and other outdoor enthusiasts probably results in under estimation of wolf numbers.

Distribution and Movements

Wolves are distributed throughout Unit 14 outside the major population centers. Reports from the public indicate that on occasion wolves do travel on the outskirts of these large cities.

Diseases/Parasites

Of 6 packs examined during louse-control efforts in Units 14A and 14B, 2 packs (Willow Mountain and Montana Creek) were confirmed to have lice. Of 2 other packs in eastern Unit 14A evaluated by inspecting the hides of wolves taken by trappers or hunters, neither appeared infested (Golden et al. 1999). Trappers continue to report infested wolves from the original packs and packs to the north and west of the original infestation. There were no indications that any 14C packs were affected. Because coyote and domestic/feral dogs are known to harbor lice, it will be very difficult to totally remove lice from the area.

MORTALITY

Harvest

Season and Bag Limit. During the report period the hunting season for Unit 14 was 10 August–30 April, with a bag limit of 5 wolves. The trapping season in Units 14A and 14B was 10 November–31 March, and in Unit 14C the trapping season ran 10 November–28 February. Trappers had no bag limit on wolves.

Board of Game Actions and Emergency Orders.

During January 1998 Division staff asked the Board of Game to clarify whether wolf-hybrids could be possessed without a permit. The Board addressed the subject by stating that in their view possession of any hybrid of an animal not on the "clean" list had always been illegal, but they added language to 5AAC 92.029 explicitly addressing possession of hybrids. Top officials in both the Division of Wildlife Conservation and Department of Public Safety, Division of Fish and Wildlife Protection (DPS/FWP) stated, however, that they would take no drastic enforcement action against the many people, and several businesses, which possess and sell hybrid wolves. The Board readdressed this issue in January of 2002 prohibiting the possession of wolf hybrids (5AAC 92.030) including offering for sale any animal represented as a wolf hybrid. In addition, possession of wolf hybrids would be allowed if the animal was sterilized and tagged with a subcutaneous microchip.

Hunter/Trapper Harvest. Harvest averaged 21 wolves per season (range 16–31) during the 5 seasons spanning 1997–98 to 2001–02 (Table 2). Most of the harvest comes from Unit 14A because it has large areas open to hunting and trapping that are highly accessible to many people. Trappers took most wolves in Unit 14 (Table 2) with more wolves taken by snares. The number of wolves shot has remained comparatively stable in the last 7 years, ranging from 4–7 animals annually. The number trapped can be greatly affected by weather and trapping conditions, whereas the number shot is more dependent on travel conditions.

Harvest Chronology. Most wolves were taken during mid-winter (December–February), when snow conditions allowed for good trapping conditions and travel. The number of wolves taken during August–October (Table 3) ranged from 9 to 25 percent. Hunters take a

significant portion of the annual harvest of wolves incidental to hunting for other species. Many of these hunters report seeing wolves with increasing frequency. During 1998–99 and 1999–2000 there was little snow on the ground during December, and extremely cold temperatures during January. These factors probably combined to increase wolf harvest during February, relative to other years. In 2001 substantial snow fell in late October and early November. Trappers were able to begin trapping when the season began on November 10.

Transport Methods. Most successful wolf trappers and hunters routinely used snowmachines to access their trapping/hunting areas (Table 4). Use of aircraft increased in 1998–99, due mainly to several experienced pilot/trappers who, after not trapping for several years, made a concerted effort to snare wolves in relatively remote parts of Unit 14.

Other Mortality

Following the louse-control capture effort there was an extended period of cold weather, with temperatures to 30 degrees below zero Fahrenheit. During this period 2 heavily louse-infested pups (or yearlings) disappeared from the Montana Creek pack. We suspect these 2 wolves died during this cold period, because of heavy pelt damage from lice (Golden et al. 1999). About 1 wolf per year is killed by vehicle collision in Unit 14C.

HABITAT

Assessment

Although wolf habitat in Unit 14 has changed significantly in the last 80 years, the large number of moose has undoubtedly allowed for increases in wolf numbers in the last 30 years. Beaver numbers are currently high and provide good summer prey. Salmon escapement has remained fairly consistent at near objective levels, providing an additional summer food source. Wolves are very adaptable and have high reproductive rates, allowing them to utilize areas altered by humans.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

We received many reports from the public about wolves attacking dogs and possibly threatening other pets and livestock. Wolves have killed an estimated 3–10 dogs/year in the Anchorage area. As wolf numbers increase, wolf/domestic animal conflicts may increase, especially with the dispersed pattern of human development in this area. Increasingly, we receive similar calls regarding wolf hybrids.

CONCLUSIONS AND RECOMMENDATIONS

While the population objectives have been met for Unit 14, and the number of wolves is increasing, systematic surveys will be necessary to maintain accurate population estimates of wolf numbers. The human-use objective was also met, with both consumptive and nonconsumptive users enjoying many opportunities to interact with wolves, even on the outskirts of urban areas. No changes in seasons or bag limits are recommended.

Surveys should be conducted every 3 years to assess wolf numbers. Minimum pack sizes can best be determined by simple reconnaissance flights when tracking conditions are best,

utilizing 2–3 aircraft during a short period in January or February. This will require an additional \$6,000, and some technical staff time, every 3 years. Current methodology (observations by staff, trappers and the public) should suffice for distribution information.

The spread of the non-native louse to the Susitna Valley is a concern for managers. Unfortunately, the sensitivity surrounding wolf issues prevent managers from acting quickly to attempt to control the infestation. Conflicting human interests precluded action involving lethal methods of control, as was the case during the initial infestation on the Kenai Peninsula (Golden et al. 1999). By the time most wolves were treated (late January 1999), some wolves had probably begun to disperse (Mech et al. 1998). Although a great effort was expended to attempt to treat infested wolves during early 1999, financial and feasibility considerations precluded a follow-up program during winter 1999–2000.

Given natural dispersal rates for wolves and current high density, it appears likely that lice will infest wolves in other parts of the state in the near future. This could reduce wolf harvest rates, impacting prey populations, trappers and managers involved in intensive management programs.

Estimates of harvest rates, based on the estimated number of wolves (Table 1), have remained at approximately 20% during the last 3 years. This is well below the 40% harvest rate considered sustainable in other areas (Ballard et al. 1987), and allows for additional dispersal of wolves, potentially accelerating the spread of lice.

Staff worked with the Board of Game to strengthen the wolf hybrid regulations. It is now much more difficult to possess or market hybrids, however, many unregistered animals exist. Both ADFG and DPS/FWP have chosen not to enforce the regulation prohibiting possession of these animals. Enforcement is admittedly difficult because people can circumvent the regulation by claiming their animal is a "husky-mix," and to date there are no simple genetic test that can differentiate between pure and hybrid wolves. Also, the Matanuska-Susitna Borough will not register an animal as a wolf hybrid because there is no approved rabies vaccine for hybrids. Many people own hybrid wolves in this area, and we receive many complaints about hybrid wolves running loose and threatening humans and livestock. We should investigate whether new genetic techniques will help distinguish between hybrid and wild wolves.

LITERATURE CITED

- BALLARD, W. B., J. S. WHITMAN AND C. L. GARDNER. 1987. Ecology of an exploited wolf population in south-central Alaska. *Wildlife Monographs* 98. 54pp.
- GOLDEN, H. N., T. H. SPRAKER, H. J. GRIESE, R. L. ZARNKE, M. A. MASTELLER, D. E. SPALINGER AND B. M. BARTLEY. 1999. Briefing paper on infestation of lice among wild canids in Alaska. Alaska Department of Fish and Game, unpublished report. See Appendix 1.
- MECH, L. D., L.G. ADAMS, T. J. MEIER, J. W. BURCH AND B. W. DALE. 1998. The wolves of Denali. University of Minnesota Press, Minneapolis, Minnesota, USA.

RAUSCH, R. A. 1967. Some aspects of the population ecology of wolves in Alaska. *American Zoologist* 7:253–265.

PREPARED BY:

Gino Del Frate
Wildlife Biologist III

SUBMITTED BY:

Michael McDonald
Assistant Management Coordinator

Please cite any information taken from this section, and reference as:

Del Frate, G. 2003. Unit 14 wolf management report. Pages 99–108 *in* C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 14 fall (pre-trapping season) wolf population estimates, 1994–2002

Year	Population estimate	Packs (nr)	Basis of estimate
1994–95	60–85	8–11	Sample Unit Probability Estimate in 14C, incidental observations in 14A and 14B.
1995–96	70–100	9–11	Incidental observations, sealing records, reports from public
1996–97	80–115	11–13	reports from trappers, staff, public
1997–98	70–105	11–13	reports from trappers, staff, public
1998–99	120–150	19–21	ADF&G staff; wolf/lice project
1999–2000	90–120	19–21	reports from trappers, staff, public
2000–01	90–120	18–21	reports from trappers, staff, public
2001–02	85–115	18–21	ADF&G staff; wolf/lice project

Table 2 Unit 14 wolf harvest, 1994–2002

Regulatory Year	Reported harvest				Method of take				Successful Trapper/hunters
	M	F	Unk	Total	Shot	Trap	Snare	Unk	
<u>Unit 14A</u>									
1994–95	9	7	0	16	7	5	4	0	8
1995–96	12	7	0	19	5	3	11	0	6
1996–97	6	4	0	10	2	4	4	0	7
1997–98	4	2	0	6	3	1	2	0	6
1998–99	6	9	1	16	4	6	6	0	10
1999–2000	5	5	0	10	3	4	2	1	8
2000–2001	7	8	0	15	3	6	6	0	12
2001–2002	5	3	0	8	3	2	3	0	7
<u>Unit 14B</u>									
1994–95	2	2	0	4	3	0	1	0	2
1995–96	2	0	0	2	0	1	1	0	2
1996–97	3	2	0	5	3	1	1	0	4
1997–98	5	2	0	7	3	3	1	0	5
1998–99	5	6	0	11	1	7	3	0	6
1999–2000	2	4	0	6	3	1	2	0	4
2000–01	4	1	0	5	0	1	3	1	3
2001–02	8	4	1	13	1	5	6	1	6
<u>Unit 14C</u>									
1994–95	0	2	0	2	1	1	0	0	2
1995–96	0	3	0	3	1	0	2	0	3
1996–97	2	2	0	4	2	0	1	1	3
1997–98	3	0	0	3	0	0	3	0	2
1998–99	2	2	0	4	0	0	4	0	2

Table 2 cont.

Regulatory Year	Reported harvest				Method of take				Successful Trapper/hunters
	M	F	Unk	Total	Shot	Trap	Snare	Unk	
<u>Unit 14C cont.</u>									
1999–2000	1	0	0	1	0	0	0	0	1
2000–01	1	0	0	1	1	0	0	1	1
2001–02	0	0	0	0	0	0	0	0	0
<u>Unit 14 Total</u>									
1994–95	11	11	0	22	11	6	5	0	12
1995–96	14	10	0	24	6	4	14	0	11
1996–97	11	8	0	19	7	5	6	1	14
1997–98	12	4	0	16	6	4	6	0	13
1998–99	13	17	1	31	5	13	13	0	18
1999–2000	8	9	0	17	6	5	4	2	13
2000–01	12	9	0	21	4	7	9	1	16
2001–02	13	7	1	21	4	7	9	1	13

Table 3 Unit 14 wolf harvest chronology percent, 1994–2002

Regulatory year	Harvest periods							<i>n</i>
	Aug–Oct	November	December	January	February	March	April	
1994–95	14	0	41	41	4	0	0	22
1995–96	4	4	42	33	8	4	4	24
1996–97	0	5	16	21	21	26	11	19
1997–98	25	0	38	6	25	0	6	16
1998–99	10	13	3	16	42	16	0	31
1999–2000	18	12	12	0	47	6	0	17 ^a
2000–01	14	5	24	19	24	14	0	21
2001–02	9	29	19	19	24	0	0	21

^a Includes one unknown date of kill.

Table 4 Unit 14 wolf harvest percent by transport method, 1994–2002

Regulatory year	Harvest percent								<i>n</i>	
	Airplane	Dogsled	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Snowshoes		Unk.
1994–95	9	0	0	23	59	0	0	9	0	22
1995–96	4	0	0	58	4	0	17	13	4	24
1996–97	5	0	0	16	47	0	5	21	5	19
1997–98	6	6	6	13	44	0	25	0	0	16
1998–99	16	3	0	13	52	0	13	3	0	31
1999–2000	6	0	0	18	41	18	6	0	12	17
2000–01	5	0	14	14	52	0	10	5	0	21
2001–02	0	5	0	5	71	5	5	0	10	21

WOLF MANAGEMENT REPORT

From: July 1, 1999

To: June 30, 2002

LOCATION

GAME MANAGEMENT UNIT: 16 (12,300 mi²)

GEOGRAPHIC DESCRIPTION: West side of Cook Inlet

BACKGROUND

Prior to the 1900s and the establishment of major human settlements in Anchorage, Palmer/Wasilla and Kenai/Soldotna, wolf numbers in Unit 16 fluctuated with prey densities. Since 1900 wolf populations have been heavily influenced by various human harvest regimes. These have ranged from predator-control strategies (including the use of poison, bounties and aerial shooting) prior to statehood to only trapping and sport hunting (Harkness 1991, Masteller 1994).

Reports from trappers, pilots and staff indicate wolf numbers began increasing in the early 1990s. The first systematic population estimate of wolves in Unit 16 occurred in March 1993, during the development of the Sample Unit Probability Estimator (Becker et al. 1998). At that time we estimated there were 48–62 wolves, in 8–10 packs, in this area. The population has more than tripled since that survey.

During November and December 1998 trappers caught several wolves (and coyotes) in the lower Susitna Valley (Units 16A and 14B) that were infested with the dog-biting louse *Trichodectes canis*. This was the first time lice had been confirmed in Alaskan wolves outside the Kenai Peninsula, where louse-infested wolves were first seen in 1981. The source of the recent infestation was unknown, but we suspect feral dogs or wolf-hybrids near the Parks Highway corridor. During January 1999 we mounted a large effort to treat infested wolves in the Susitna Valley, to prevent the spread of lice to other areas of the state. Our efforts revealed that 1 pack in Unit 16A (and 2 adjacent packs in Unit 14B) were infested. We attempted to capture and treat all infested wolves with the antiparasitic drug ivermectin (Merck & Co, Inc.). We also distributed medicated baits, meant to treat coyotes, dogs and lone wolves. However, we were unsuccessful in eliminating lice from area wolves, as 6 louse-infested wolves (including 2 that had previously been treated) were trapped or found dead in Unit 16 during winter 1999–2000. These wolves were distributed from the lower Beluga River north to the West Fork of the Yentna River and east to the Susitna River.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

The goal for this area is to retain desirable predator/prey ratios and provide a sustainable harvest of wolves.

MANAGEMENT OBJECTIVES

The population objective is to maintain a wolf population of 30–60 wolves in at least 4 packs. This should include 8–15 wolves (in 1–3 packs) in Unit 16A and 22–45 wolves (in 3–5 packs) in Unit 16B. The human-use objective is to allow maximum opportunity for harvest while maintaining minimum wolf population objectives.

METHODS

We estimated wolf numbers, distribution and population trends based on observations by staff, trappers, hunters and pilots and from interviews with trappers and hunters sealing fur from Unit 16. During 1998–99 numbers were estimated during our effort to control the lice infestation in the area. Annual wolf harvest was determined by sealing all wolves presented for examination.

With the unanticipated discovery of louse-infested wolves in this area and the fear the infestation would move north, we met with staff from headquarters and from the Southcentral and Interior Regions to discuss management options, political considerations and funding strategies. We decided that area staff would use non-lethal means to attempt to eliminate lice from Susitna Valley wolves and coyotes, employing a capture/treatment program for wolves and distribution of medicated baits for coyotes.

We enlisted the aid of several other area biologists in our effort to capture and treat all infested wolves in the Susitna Valley. We used aerial reconnaissance from Piper PA-18 aircraft to first locate and examine wolf packs, then we captured 1–2 wolves in each pack to confirm the presence or absence of lice. We captured and treated all known members of the infested packs, using 2 capture crews with 2 Robinson R-22 helicopters. Wolves were immobilized using Telezol and ivermectin was administered to rid wolves of lice. We also distributed approximately 1200 meat baits, containing ivermectin paste, in the general area occupied by infested packs, to attempt to medicate coyotes and lone wolves potentially missed during our capture operation. Radiocollared wolves were tracked periodically to visually assess pelt characteristics and whether all pack members had been treated. No efforts were made to treat domestic pets in the affected area. The louse control effort is outlined completely in Golden et al. (1999).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Unit 16 contained an estimated 120–140 wolves, in 16–19 packs, during fall 1998 (Table 1). This is approximately twice the number estimated during February 1993. In 2001–02 we estimated that the population increased an additional 50%. The effort to control the spread of lice allowed us to get reliable minimum estimates of pack sizes and distribution in a large portion of Unit 16 and the resulting numbers were substantially higher than previous estimates in those areas. This demonstrates that the "traditional" method of estimating wolf populations solely from incidental observations by staff, trappers, pilots and other outdoor enthusiasts probably results in a significant under estimation of wolf numbers.

The wolf population probably peaked in 2001–02. Most large prey species have declined substantially in recent years and we expect wolf productivity to decline. However, summer food sources are still abundant.

Distribution and Movements

Wolves inhabit most portions of Unit 16 (Table 2). Several packs utilize portions of other units. Territory boundaries can be very fluid over time, depending on factors such as wolf and prey density (Mech et al. 1998)

Diseases/Parasites

Of 7 packs examined during the louse-control effort in Units 16, only 1 pack (Deshka River) was confirmed to have lice. An additional pack (Beluga River), evaluated by inspecting the hides of wolves taken by trappers or hunters, did not appear infested (Golden et al. 1999). We captured and treated 11 wolves in the Deshka River pack and 2 wolves each in the Kahiltna River, Alexander Creek and Theodore River packs. The Kahiltna Glacier and Yentna River packs were classified as "clean" based on aerial observations only. The operational cost of the louse-control effort was \$60,000 (including both Units 14 and 16).

MORTALITY

Harvest

Season and Bag Limit. During the report period the hunting season for Unit 16 was 10 August–30 April, with a bag limit of 5 wolves. The trapping season was 10 November–31 March, with no bag limit.

Board of Game Actions and Emergency Orders. During January 1998 Division staff asked the Board of Game to clarify whether wolf-hybrids could be possessed without a permit. The Board addressed the subject by stating that in their view possession of any hybrid of an animal not on the "clean" list had always been illegal, but they added language to 5AAC 92.029 explicitly addressing possession of hybrids. Top officials in both the Division of Wildlife Conservation and Department of Public Safety, Division of Fish and Wildlife Protection (DPS/FWP) stated, however, that they would take no drastic enforcement action

against the many people and several businesses which possess and sell hybrid wolves. The Board readdressed this issue in January of 2002 prohibiting the possession of wolf hybrids (5AAC 92.030) including offering for sale any animal represented as a wolf hybrid. In addition, possession of wolf hybrids would be allowed if the animal was sterilized and tagged with a subcutaneous microchip.

Hunter/Trapper Harvest. Harvest averaged 50 wolves per year (range 17–88) during 1997–2001 (Table 3), continuing an increasing trend since the late 1980s. Trappers took most wolves in Unit 16 (Table 2) by snares. The number of wolves shot fluctuated annually from 26–68 percent. The number trapped can be greatly affected by weather and trapping conditions, whereas the number shot is more dependent on travel conditions. The total number of trappers/hunters has generally been increasing, probably because of increases in human population, increases in wolf populations and improvements in snowmachines.

Harvest Chronology. Most wolves were taken during mid-winter (December–March), when snow conditions allowed for good trapping conditions and travel. The number of wolves taken during August–October (Table 3) ranged from 11 to 44 percent. Hunters take a significant portion of the annual harvest of wolves incidental to hunting for other species. Many of these hunters report seeing wolves with increasing frequency.

Transport Methods. Most wolves are taken by people using snowmachines or aircraft to access their hunting or trapping area (Table 4).

HABITAT

Assessment

Moose populations throughout Unit 16 have been declining. Many hunters report Dall sheep and caribou numbers are declining in the Alaska Range. Summer foods like beaver and salmon remain abundant. Heavy snow conditions in the Susitna Valley during winter 1999–2000 undoubtedly increased both moose vulnerability to wolves and moose starvation, providing plentiful carrion. Human density has increased slightly, but generally there are large areas with few permanent residents. Recreational development continues to increase, with more seasonal-use cabins, boating and fishing.

CONCLUSIONS AND RECOMMENDATIONS

Our wolf population objective has not been met because we estimate the population is 3–4 times larger than the stated objective. Our wolf human-use objective has been met and no regulatory changes are recommended. Harvest rates, which were 23–56% annually during the report period, were above sustainable rates (Ballard et al. 1987) for the last two years and may help to achieve our population objectives.

The wolf management goals for this area include conserving the wolf population, providing sustainable wolf harvest and retaining "desirable" predator–prey ratios. With a growing population and relatively low harvest rates, the first 2 goals have been met. However, we have not defined desirable predator–prey ratios. With the increase in wolf numbers and decrease in moose numbers, the number of moose per wolf has declined from approximately 250:1 in

1993 to 70:1 in 1999 and possibly as few as 25:1 in 2001. This trend is similar to other areas where moose populations were declining or stationary, and predation (by both wolves and bears) was the suspected major factor limiting moose population growth (Gasaway et al. 1992). Good summer prey availability, harsh winter conditions increasing vulnerability of moose (and sheep and caribou) and potentially reduced wolf harvest rates because of lice may combine to further increase wolf density.

Managers must consider that Unit 16B is an "intensive management" area for moose. The Board of Game authorized a wolf predation control implementation plan in March of 2003. This action and subsequent results will be described in future reports.

It is difficult to identify population trends without regular attempts to systematically assess population size. Because of the extraordinary efforts stemming from the louse infestation, we were able to develop a good minimum population estimate to compare with our systematic survey of 1993. It appears the population has at least tripled between 1993 and 2001 and that wolf numbers cannot accurately be estimated using only anecdotal and sealing information. Surveys should be conducted every 3 years to assess wolf numbers. Demographic and distribution information can be determined with simple reconnaissance flights when visibility and snow-tracking conditions are best, using 2–3 aircraft during a short period in early winter. This will require approximately \$8,000 and appropriate technical staff time every 3 years.

The spread of the nonnative louse to the Susitna Valley is a concern for managers. Six infested wolves, including 2 that had been treated in January 1999, were trapped in Unit 16 during winter 1999–2000. Additional infested wolves have been trapped each year since. This indicates we were unsuccessful in eliminating lice from the area. With current high wolf densities, this parasite could spread rapidly within the Susitna Valley. Given natural dispersal rates for wolves (Mech et al. 1998), it is likely that lice will infest wolves in other parts of the state in the near future. Managers in other areas should be prepared to answer public inquiries regarding division policy in this matter.

LITERATURE CITED

- BALLARD, W. B., J. S. WHITMAN AND C. L. GARDNER. 1987. Ecology of an exploited wolf population in southcentral Alaska. *Wildlife Monographs* 98. 54pp.
- BECKER, E. F., M. A. SPINDLER AND T. O. OSBORNE. 1998. A population estimator based on network sampling of tracks in the snow. *Journal of Wildlife Management* 62:968–977.
- GASAWAY, W. C., R. D. BOERTJE, D. V. GRAANGARD, D. G. KELLEYHOUSE, R. O. STEPHENSON AND D. G. LARSEN. 1992. The role of predation in limiting moose at low densities in Alaska and Yukon and implications for conservation. *Wildlife Monographs* 120. 59pp.
- GOLDEN, H. N., T. H. SPRAKER, H. J. GRIESE, R. L. ZARNKE, M. A. MASTELLER, D. E. SPALINGER AND B. M. BARTLEY. 1999. Briefing paper on infestation of lice among

wild canids in Alaska. Alaska Department of Fish and Game, unpublished report. See Appendix 1.

HARKNESS, D. B. 1991. Wolf, Unit 16. Pages 78–82 *in* S. M. Abbott, ed. Wolf survey-inventory management report. 1 July 1989–30 June 1990. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Grants W-23-3, W-23–4. Study 14.0. Juneau, Alaska USA

MASTELLER, M. A. 1994. Wolf, Game Management Unit 16. Pages 85–90 *in* Hicks, M. V., ed. Wolf survey-inventory management report. 1 July 1991–30 June 1993. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Grants W-23-5, W-24-1, W-24-2. Study 14.0. Juneau, Alaska USA.

MECH, L. D., L.G. ADAMS, T. J. MEIER, J. W. BURCH AND B. W. DALE. 1998. The wolves of Denali. University of Minnesota Press, Minneapolis, Minnesota, USA.

PREPARED BY:

Gino Del Frate
Wildlife Biologist III

SUBMITTED BY:

Michael G. McDonald
Assistant Management Coordinator

Please cite any information taken from this section, and reference as:

Del Frate, G. 2003. Unit 16 wolf management report. Pages 109–117 *in* C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 16 fall wolf population estimates^a, 1994–2002

Year	Population estimate	Packs (nr)	Basis of estimate
1994–95	57–79	11–13	Incidental observations, sealing records, reports from public
1995–96	46–75	11–13	reports from trappers, staff, public
1996–97	60–85	10–12	reports from trappers, staff, public
1997–98	75–110	12–15	reports from trappers, staff, public
1998–99	120–140	16–19	ADFG staff, wolf/lice project
1999–2000	140–160	16–19	reports from trappers, staff, public
2000–01	110–150	16–21	reports from trappers, staff, public
2001–02	160–245	25–28	reports from trappers, staff, public and late winter pack survey

^a Fall estimate = pre-trapping season population.

Table 2 Unit 16 wolf harvest, 1994–2002

Regulatory year	Reported harvest				Method of take				Successful Trapper/hunters
	M	F	Unk	Total	Shot	Trap	Snare	Unk	
1994–95	14	14	0	28	17	4	7	0	16
1995–96	6	9	0	15	6	1	8	0	7
1996–97	13	12	1	26	14	3	9	0	14
1997–98	8	8	1	17	5	3	9	0	9
1998–99	13	20	2	35	15	6	13	1	22
1999–2000	16	28	2	46	17	7	19	3	24
2000–01	31	30	1	62	42	6	14	0	42
2001–02	46	38	4	88	23	19	46	0	35

Table 3 Unit 16 wolf percent harvest chronology, 1994–2002

Regulatory year	Percent of Harvest							<i>n</i>
	Aug.–Oct.	November	December	January	February	March	April	
1994–95	7	0	14	61	11	7	0	28
1995–96	0	13	20	0	33	27	7	15
1996–97	35	4	4	31	15	8	4	26
1997–9	12	6	18	18	35	6	6	17
1998–99	31	3	3	14	26	20	0	35
1999–2000	11	15	20	13	11	15	15	46
2000–01	44	5	3	18	13	5	10	62
2001–02	13	8	32	16	13	14	6	88

Table 4 Unit 16 wolf harvest percent by transport method, 1994–2002

Regulatory year	Harvest percent									<i>n</i>
	Airplane	Dogsled	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Snowshoes	Unk.	
1994–95	18	11	4	0	43	0	7	18	0	28
1995–96	27	0	0	0	73	0	0	0	0	15
1996–97	31	4	4	0	54	0	0	8	0	26
1997–98	12	0	0	0	88	0	0	0	0	17
1998–99	34	0	9	9	37	0	3	3	6	35
1999–2000	15	0	2	0	63	0	0	7	13	46
2000–01	21	5	8	11	39	0	0	13	3	62
2001–02	16	2	2	2	72	1	0	2	2	88

WOLF MANAGEMENT REPORT

From: July 1, 1999

To: June 30, 2002

LOCATION

GAME MANAGEMENT UNIT: 17 A, B and C (18,800 mi²)

GEOGRAPHIC DESCRIPTION: Northern Bristol Bay

BACKGROUND

Wolves are common throughout the northern Bristol Bay area; however, we have no objective data on the historic or current abundance of wolves in this area. Harvest data from 1962 to the present provide some indication of wolf distribution and relative abundance, but these data are inconsistent. Bounty records give us a partial record of harvest from 1962 through 1971. Mandatory sealing records from 1972 to the present provide greater accuracy in harvest reporting. In 1988 the department implemented a trapper questionnaire program to collect information on relative abundance of furbearers, including wolves.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain a wolf population that will sustain an annual harvest of at least 25 wolves

METHODS

We collected harvest data from trappers when they brought their wolf pelts in for sealing. In 1988 we started sending an annual trapper questionnaire to selected trappers in the unit to quantify their observations of furbearer populations during the trapping season and to estimate trends in the populations. We also gained insight into wolf population trends and distribution incidental to moose and caribou surveys, as well as observations from local air taxi pilots.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Trapper reports and general observations indicate that the wolf population likely increased during this reporting period. Wolf density peaked in Unit 17 from 1974 to 1977 but declined sharply by 1980. Rabies may have been a contributing factor. Densities seemed to increase again until 1989 when another rabies epidemic affected canid populations in the unit. Wolf populations began to increase again in 1992.

Population Size

The estimated 2001 fall wolf population in Unit 17A was 20–30 wolves in 6 to 8 packs; the Unit 17B population was 280–320 wolves in 16 to 22 packs; and the Unit 17C population was 150–200 wolves in 10 to 16 packs (Table 1).

Distribution and Movements

Wolves are present throughout the unit. Highest densities are along the major drainages of the Nushagak and Mulchatna Rivers. There is no evidence of transitory packs that follow the Mulchatna caribou herd, although lone wolves are occasionally seen with the herd as it moves throughout the region. Packs are more likely to have established territories and take advantage of caribou when they move through those territories.

MORTALITY

Harvest

Season and Bag Limit.

Hunting:	Unit 17	5 wolves	August 10–April 30
Trapping:	Unit 17	No Limit	November 10–March 31

Board of Game Actions and Emergency Orders. The Board of Game restricted the bag limit for hunters from 10 to 5 wolves starting in the 1992–93 regulatory year. This action resulted from a statewide proposal and was not precipitated by biological concerns specific to wolf populations in Unit 17. Statewide regulations affecting same-day-airborne shooting of wolves fluctuated between 1991 and 1993. During 1991–92 all same-day-airborne trappers were required to affix a metal locking tag to wolves as soon as they were harvested. In 1992–93 same-day-airborne trapping was prohibited. Starting in the 1993–94 season, same-day-airborne trapping was reinstated, but trappers were required to be more than 300' from their aircraft before shooting a wolf. In 1996 a referendum was passed prohibiting the take of wolves same day as airborne. In late winter of 1996–97, taking wolves the same day as airborne became illegal. There were no Board actions changing wolf seasons or bag limits in Unit 17 during this reporting period.

Hunter/Trapper Harvest. The wolf harvest in Unit 17 fluctuates greatly from year to year and is greatly dependent upon winter travel conditions. The past 5 year (1997–98 through 2001–02) annual average harvest was 90 wolves (Table 2). During 1999–00, 34 hunter/trappers reported taking 84 wolves (60 males, 23 females, 1 sex not reported), with 3 taken in Unit 17A, 55 from 17B and 26 taken in 17C. During 2000–01, 41 hunter/trappers reported taking 89 wolves (45 males, 40 females, 4 sex not reported), with none taken in Unit 17A, 59 from 17B and 30 taken in 17C. During 2001–02, 35 hunter/trappers reported taking 91 wolves (46 males, 43 females, 2 sex not reported), with 1 taken in Unit 17A, 59 from 17B and 35 taken in 17C. Most were taken with firearms (Table 2).

Harvest Chronology. Harvest chronology has been quite variable. Most wolves were harvested in January and February (Table 3). In most years, harvest chronology reflects the

suitability of snow conditions for tracking and travel rather than the availability of wolves. Harvest of wolves incidental to moose and caribou hunting activities during August and September has increased during the past few years, due to increased numbers of moose and caribou hunters, as well as wolves.

Transport Methods. Before 1992, aircraft were the most common means of transport of wolf hunter/trappers in Unit 17 (Table 4). With the prohibition of same-day-airborne taking of wolves in 1992–93 and after 1996–97, most wolves have been harvested by hunter/trappers using snowmachines for transportation. The advent of larger, more reliable snowmachines has contributed greatly to the use of these machines when hunting and trapping wolves.

CONCLUSIONS AND RECOMMENDATIONS

Few data are available to interpret the status of the wolf population in Unit 17. General observations and public contacts suggest that the wolf population is healthy and has rebounded from the apparent decline from 1989 through 1992. Moose and caribou are probably the primary prey for most packs in the unit. Although no packs are known to follow the Mulchatna caribou herd in Unit 17, wolves in this unit appeared to take advantage of this herd as it increased through the mid 1990s. It is logical to expect that wolf populations increased along with the prey densities.

The apparent cause of declines in wolf numbers in the late 1970s and late 1980s is unknown but rabies was suspected. There is no evidence that human-induced mortality was the cause of these declines. Rabies is endemic to fox populations in southwestern Alaska and red fox populations are greatly influenced by periodic epidemics. One rabid wolf was confirmed from the unit in 1981. Samples from 6 wolves that were trapped in Unit 17 area in 1991–92 were sent to the Alaska State Virology Laboratory for rabies tests. All were negative; however, the tests could not determine if the wolves had been exposed to rabies at one time and survived.

Same-day-airborne shooting of wolves was historically a common and effective method of harvesting wolves in Unit 17. Department records confirm this from 1961–62 through 1991–92 and local residents have documented extensive use of aircraft by wolf hunters back to the 1930s. Prohibition of same-day-airborne wolf shooting in 1992–93 resulted in a shift to snowmachines for access.

Aerial surveys of Unit 17 are needed to better quantify population density. Nearly constant winds cause fresh snow to drift rapidly, however, and good survey conditions seldom last more than 1 day. Survey efforts should be coordinated with department personnel in Units 9 and 19 to maximize the area surveyed while good conditions last.

PREPARED BY:

James D. Woolington
Wildlife Biologist III

SUBMITTED BY:

Michael G. McDonald
Assistant Management Coordinator

Please cite any information taken from this section, and reference as:

Woolington, J. D. 2003. Unit 17 wolf management report. Pages 118–125 *in* C. Healy, editor. Wolf management report of survey and inventory activities 1 July 1999–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 17 fall wolf population estimates^{a, b}, 1991–92 to 2001–02

Year	Population estimate	Number of packs
1991–92	200–250	20–30
1992–93	250–350	20–30
1993–94	300–350	25–35
1994–95	400–475	30–40
1995–96	320–425	30–42
1996–97	320–425	30–42
1997–98	350–465	32–46
1998–99	350–465	32–46
1999–00	450–550	32–46
2000–01	450–550	32–46
2001–02	450–550	32–46

^aFall estimate = pre-trapping season population.

^bEstimates based on trapper questionnaire, incidental observations during moose and caribou surveys and harvest data.

Table 2 Unit 17 wolf harvest, 1991–92 to 2001–02

Regulatory year	Reported harvest				Method of take (%)			Successful hunter/ trappers
	Male	Female	Unk	Total	Trap/snare	Shot	Unk	
1991–92	20	9	8	37	9 (24%)	28 (76%)	0 (–)	20
1992–93	12	5	2	19	4 (21%)	15 (79%)	0 (–)	14
1993–94	29	16	10	55	0 (–)	55 (100%)	0 (–)	21
1994–95	75	35	11	121	33 (27%)	88 (73%)	0 (–)	34
1995–96	26	15	0	41	15 (27%)	26 (63%)	0 (–)	18
1996–97	35	15	3	53	9 (17%)	44 (83%)	0 (–)	24
1997–98	71	35	1	107	17 (16%)	86 (80%)	4 (4%)	39
1998–99	50	28	0	78	9 (12%)	68 (87%)	1 (1%)	39
1999–00	60	23	1	84	14 (17%)	68 (81%)	2 (2%)	34
2000–01	45	40	4	89	13 (15%)	75 (84%)	1 (1%)	41
2001–02	46	43	2	91	38 (42%)	52 (57%)	1 (1%)	35

Table 3 Unit 17 wolf harvest chronology percent by time period, 1991–92 to 2001–02

Regulatory year	Harvest period						n
	December	January	February	March	April	Unknown/Other	
1991–92	5%	32%	30%	22%	--	11%	37
1992–93	5%	21%	53%	11%	--	10% ^a	19
1993–94	22%	27%	16%	26%	4%	6% ^b	55
1994–95	14%	7%	32%	17%	--	30% ^c	121
1995–96	2%	20%	49%	22%	--	--	41
1996–97	9%	43%	28%	9%	--	9%	53
1997–98	12%	27%	39%	7%	--	15%	107
1998–99	19%	32%	19%	14%	--	15%	78
1999–00					--		
	12%	11%	31%	19%		27%	84
2000–01					1%		
	7%	11%	22%	35%		24%	89
2001–02					--		
	7%	16%	42%	13%		22%	91

^aIncludes 1 wolf (5%) harvested in August and 1 wolf (5%) harvested in October.

^bIncludes 3 wolves (6%) harvested in September.

^cIncludes 2 wolves (2%) harvested in August, 8 (7%) in September, 1 (1%) in October, 21 (17%) in November and 4 (4%) harvested at unknown times.

Table 4 Unit 17 wolf harvest percent by transport method, 1991–92 to 2001–02

Regulatory year	Percent of harvest								N
	Airplane	Dogsled Skis Snowshoes	Boat	3- or 4-Wheeler	Snow machine	ORV	Highway vehicle	Unk	
1991–92	70%	--	--	--	30%	--	--	--	37
1992–93	5%	5%	--	--	84%	--	5%	--	19
1993–94	36%	2%	--	2%	58%	--	--	2%	55
1994–95	29%	10%	2%	--	60%	--	--	2%	121
1995–96	19%	5%	--	--	49%	--	--	--	41
1996–97	28%	--	--	--	72%	--	--	--	53
1997–98	18%	--	--	--	74%	--	--	8%	107
1998–99	12%	1%	1%	--	83%	--	--	3%	78
1999–00	20%	1%	1%	--	74%	--	--	4%	84
2000–01	17%	1%	4%	--	73%	--	1%	3%	89
2001–02	12%	1%	--	1%	73%	--	1%	12%	91